

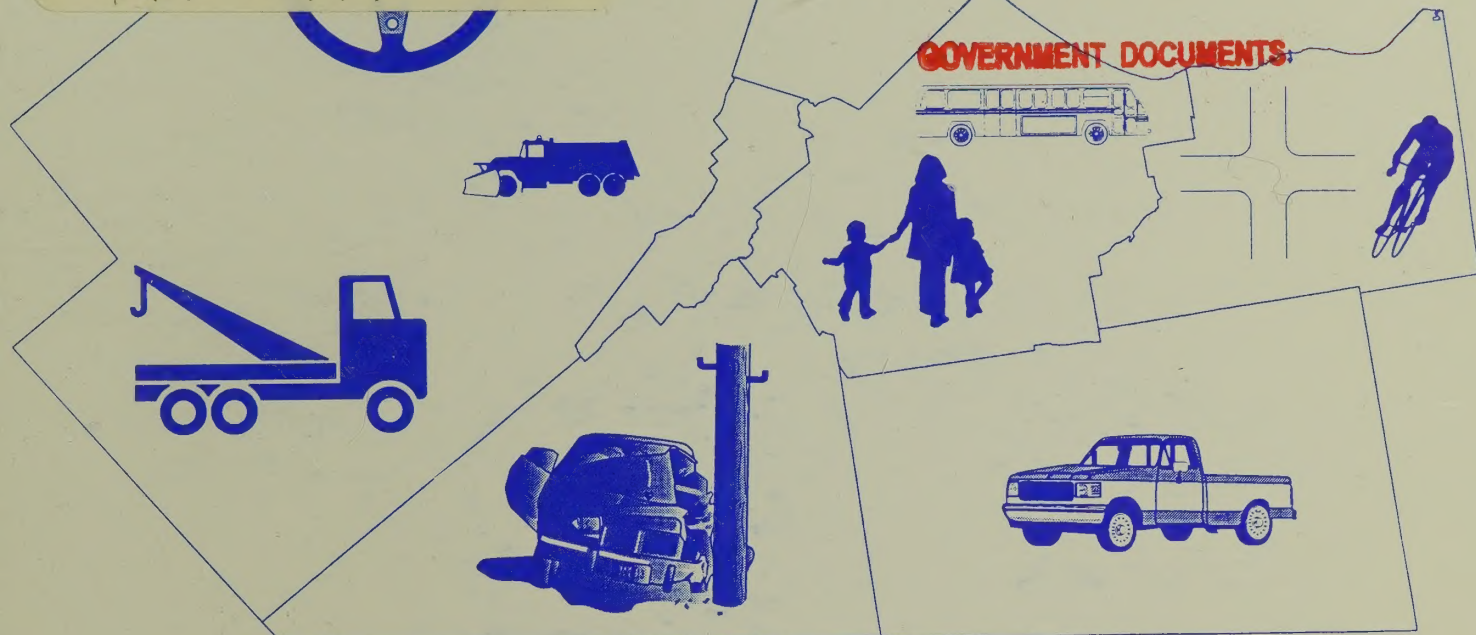
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1997-1999 HAMILTON-WENTWORTH COLLISION REPORT VOLUME 2: DRIVERS, PEDESTRIANS AND ENVIRONMENT

PREPARED BY:

TRANSPORTATION, OPERATIONS AND
ENVIRONMENT

1997-1999 Hamilton-Wentworth Collision Report
Volume 2: Drivers, Pedestrians and Environment

Prepared By:

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Transportation, Operations and Environment Division

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1997-1999 HAMILTON-WENTWORTH COLLISION REPORT - VOLUME 2

Introduction

The report is a summary of general factors associated with traffic collisions that occurred in the Regional Municipality of Hamilton-Wentworth in 1997, 1998 and 1999. This report details driver and pedestrian behaviour and road and weather conditions based on a 3-year average. **All statistics in this report are an average of the 1997, 1998 and 1999 occurrences.** The information in this portion is produced every 3 years. A companion report (Volume 1) details specifics of locations and trends and is produced annually.

The Regional Municipality of Hamilton-Wentworth is situated in southern Ontario at the westerly end of Lake Ontario. The following municipalities are located within the Region: the Town of Ancaster; the Town of Dundas; the Town of Flamborough; the Township of Glanbrook; the City of Hamilton and the City of Stoney Creek. The estimated total population of these combined localities was 467,799 in 1996.

Traffic collisions are a primary cause of accidental deaths, injuries and associated property losses. The intention of this report is to provide factual information to those agencies and persons concerned with the safety of the roadway transportation system within the Regional Municipality of Hamilton-Wentworth.

Traffic collisions frequently involve complex interactions between human behaviour, vehicle characteristics and environmental conditions. The factor or factors responsible for causing a collision are not always the most obvious nor are they always readily apparent. Caution should be exercised in drawing conclusions from the statistics presented in this report and conclusions should be drawn only with appropriate qualifications and supportive information.

The information presented in this report is based primarily upon motor vehicle collisions investigated by the Hamilton-Wentworth Regional Police. Citizen – reported collisions are not included in the statistics. The geographic area includes all roads in Hamilton –Wentworth, excluding collisions occurring on the following roads: Highway 6, north of Highway 403; Highway 8 in

Flamborough; the Queen Elizabeth Way; Highway 403 and on-ramps and off-ramps to Highway 403. Collisions occurring on service roads to the Queen Elizabeth Way are included.

SUMMARY

- * The period from 1 a.m. to 5 a.m. exhibits the highest ratio of collisions to vehicle volume using the street system.
- * Drivers under the age of 24 years were involved in a disproportionate number of collisions relative to the age distribution of the licensed driving population of Ontario.
- * The predominant improper driver action indicated in collisions was "failed to yield right-of-way".
- * 5.0 percent of reported collisions involved one or more drivers who had been drinking.
- * Most collisions involving alcohol occurred in the evening from 8 p.m. to 3 a.m. These figures are indicative of alcohol being present in the bloodstream of one or more of the drivers involved in the collision and do not necessarily mean that alcohol was the proximate cause of the collision.
- * Pedestrians between the ages of 5 and 24 years and over 75 years of age were involved in a disproportionate number of collisions based on the age distribution of the population of Hamilton-Wentworth. Pedestrians between the ages of 10 and 14 years of age were most frequently involved in a collision as a result of crossing without right-of-way or running onto the roadway.

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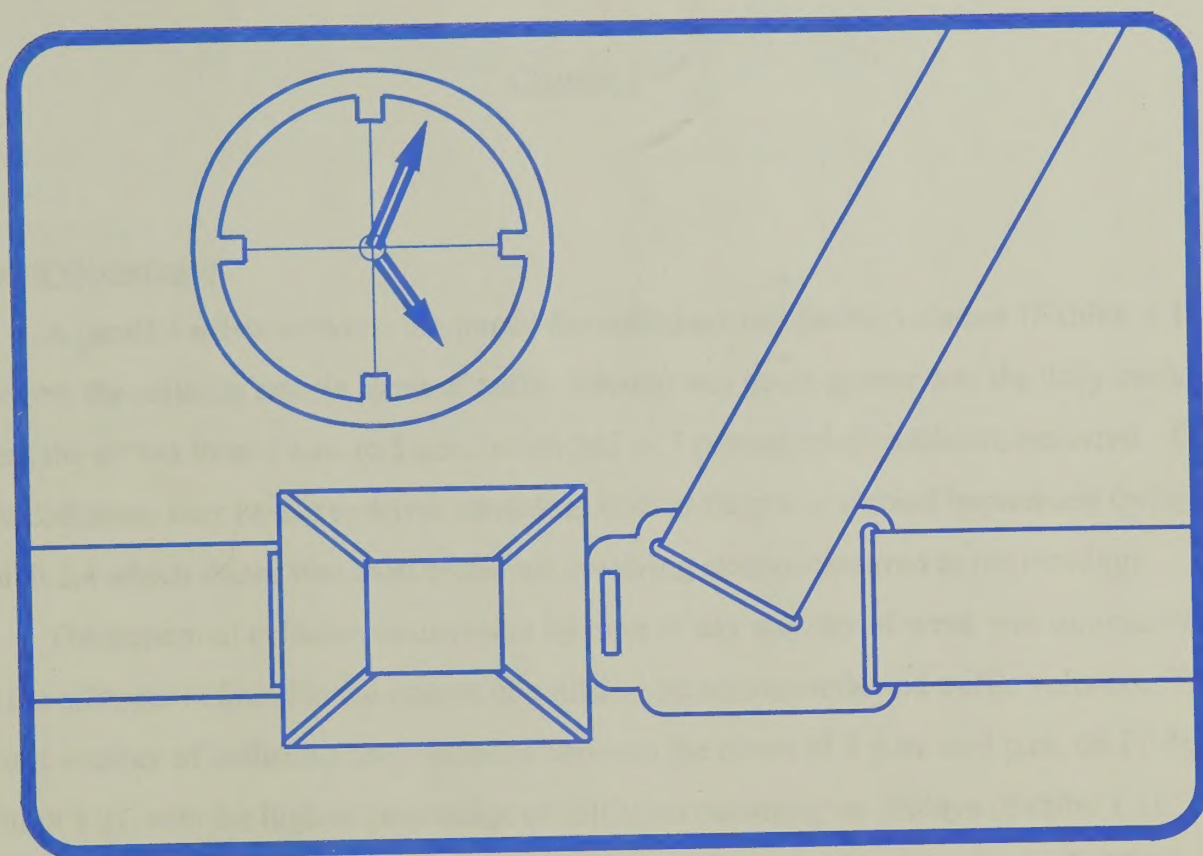
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Chapter One

Selected

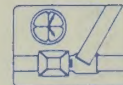
Characteristics



Chapter One

Selected

Characteristics



Chapter 1

Time of Occurrence

A parallel exists between the trends for collisions and traffic volumes (Exhibit 1.1). However, the collision rate (in terms of traffic volume) was much greater than the daily average during the period from 1 a.m. to 5 a.m., when 385 or 7 percent of all collisions occurred. The night collisions may be due to driver conditions such as fatigue or alcohol impairment (refer to Exhibit 2.4 which shows that most collisions involving alcohol occurred in the evening).

The pattern of collision occurrences by time of day and day of week was summarised, and the differences found in the pattern of collision occurrence reflected traffic volumes. The highest number of collisions (86) occurred between the hours of 3 p.m. to 4 p.m. on Fridays (Exhibit 1.2), with the highest percentage of collisions occurring on Fridays (Exhibit 1.3).

The pattern of collision occurrences was compared on a month of year basis (Exhibit 1.4) and there was a difference in the number of collisions which occurred each month. The highest number of collisions occurred during January and November. This is likely due to drivers not adjusting for road conditions during winter driving.

Impact Type

The type of initial impact was compared with the injury classification of the collisions (Exhibit 1.5). The probability of an injury or fatality resulting from a collision was highest in "head on" (54%) and "pedestrian/vehicle" (94%) collision types. However, these collision types only make up 7.1 percent of the total collisions. The majority of collisions were either "rear end" (1311) or "right angle" (883) in nature.

Greater than one half of all collisions were associated with intersections (Exhibit 1.6). 21.5 percent of collisions occurred at or near signalized intersections and 17.6 percent occurred at or near intersections with stop or yield control (Exhibit 1.7). Sixty percent of all collisions occurred at locations with no form of traffic control.

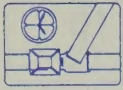
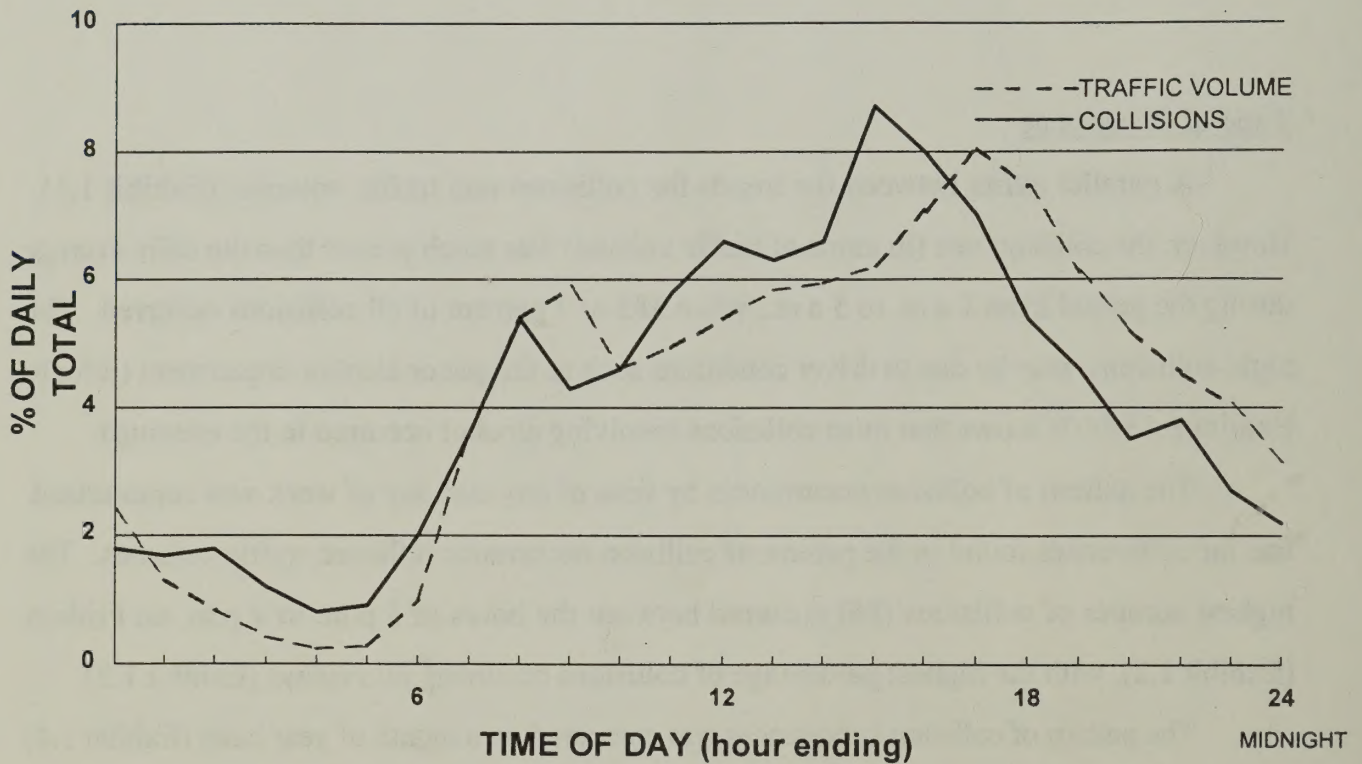
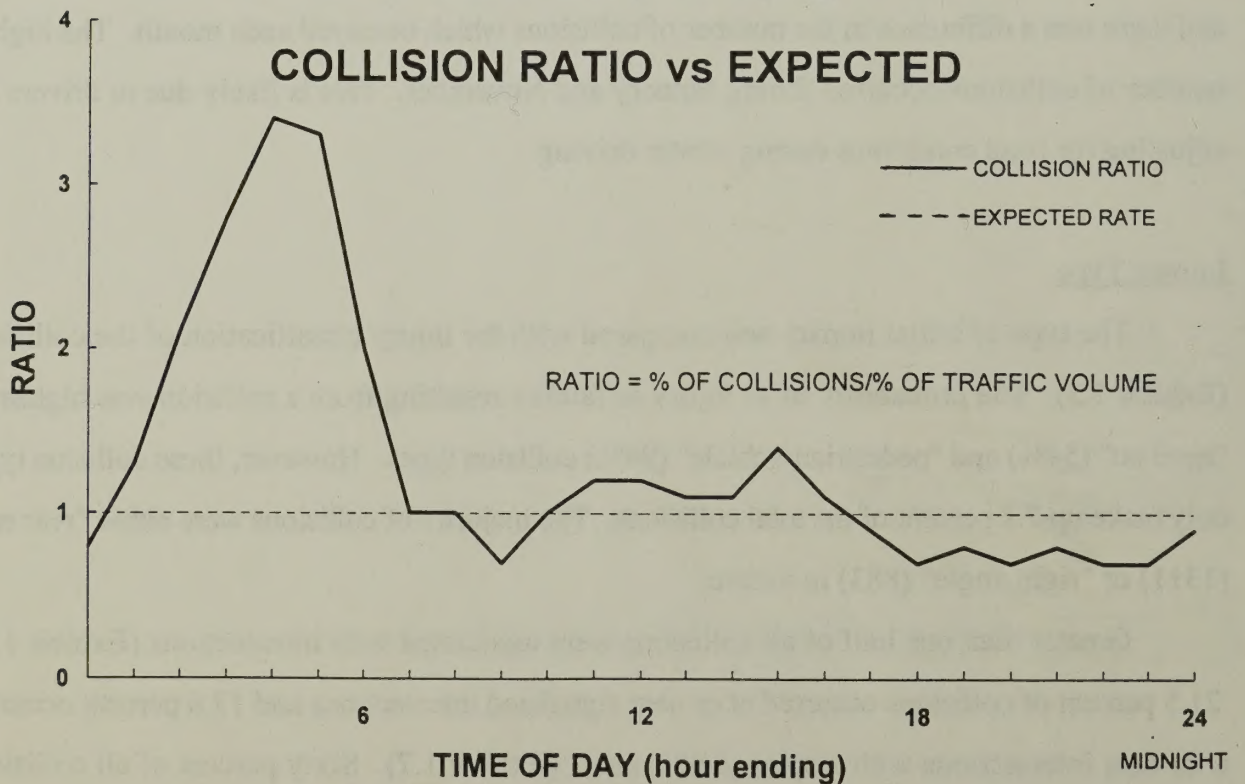


Exhibit 1.1

TIME OF DAY vs TRAFFIC VOLUME



COLLISION RATIO vs EXPECTED



COLLISIONS OCCURRED AT A MUCH HIGHER THAN EXPECTED RATE (RELATIVE TO TRAFFIC VOLUME) BETWEEN 1 A.M AND 5 A.M DAILY

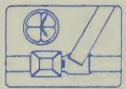
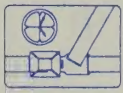


Exhibit 1.2

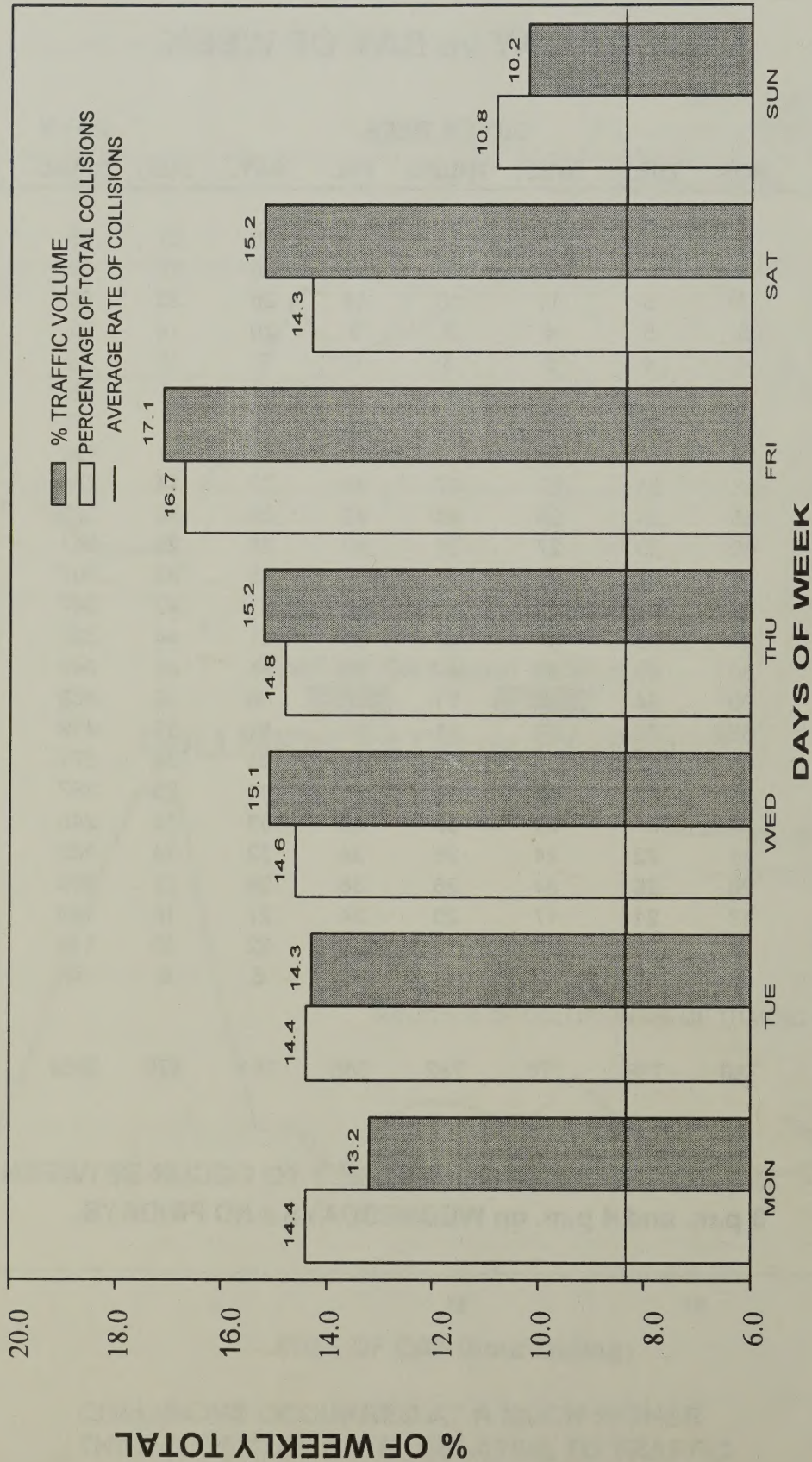
TIME OF DAY vs DAY OF WEEK

TIME OF DAY	DAY OF WEEK						DAILY		%
	MON.	TUES.	WED.	THURS.	FRI.	SAT.	SUN.	TOTAL	
12-1 a.m.	10	10	10	12	13	20	21	95	1.8%
1-2 a.m.	5	5	6	10	12	26	25	89	1.7%
2-3 a.m.	7	5	11	10	14	26	23	96	1.8%
3-4 a.m.	5	5	4	7	8	20	14	62	1.2%
4-5 a.m.	4	4	3	8	6	7	12	43	0.8%
5-6 a.m.	7	6	8	7	7	7	6	48	0.9%
6-7 a.m.	16	17	18	20	16	10	7	103	2.0%
7-8 a.m.	32	34	35	31	34	16	7	190	3.6%
8-9 a.m.	53	51	53	47	49	20	11	284	5.4%
9-10 a.m.	35	34	38	40	40	26	16	229	4.3%
10-11 a.m.	40	33	27	38	43	35	25	241	4.6%
11-12 NOON	47	46	43	42	54	43	33	307	5.8%
12-1 p.m.	47	51	46	57	52	51	42	347	6.6%
1-2 p.m.	45	49	41	45	57	51	44	332	6.3%
2-3 p.m.	50	49	47	49	56	55	40	346	6.6%
3-4 p.m.	70	64	74	71	86	55	39	458	8.7%
4-5 p.m.	65	72	69	61	65	51	37	419	8.0%
5-6 p.m.	59	62	55	54	64	44	34	371	7.0%
6-7 p.m.	41	42	43	49	46	41	26	287	5.5%
7-8 p.m.	34	37	39	33	39	33	32	245	4.6%
8-9 p.m.	25	22	24	26	34	32	24	186	3.5%
9-10 p.m.	26	26	34	26	38	28	22	200	3.8%
10-11 p.m.	17	21	17	20	24	27	16	143	2.7%
11-12 MIDNIGHT	14	13	20	15	21	22	10	114	2.2%
UNKNOWN	4	3	4	7	4	6	6	35	0.7%
WEEKLY TOTAL	758	758	770	782	880	751	570	5269	100%

**COLLISIONS WERE MOST LIKELY TO OCCUR BETWEEN
3 p.m. and 4 p.m. on WEDNESDAYS AND FRIDAYS.**



DAY OF WEEK vs COLLISIONS AND VOLUME



MONDAY, TUESDAY AND SUNDAY HAD MORE COLLISIONS THAN EXPECTED WHEN COMPARED TO TRAFFIC VOLUME. THE HIGHEST NUMBER OF COLLISIONS OCCURRED ON FRIDAYS.

Exhibit 1.3

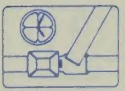
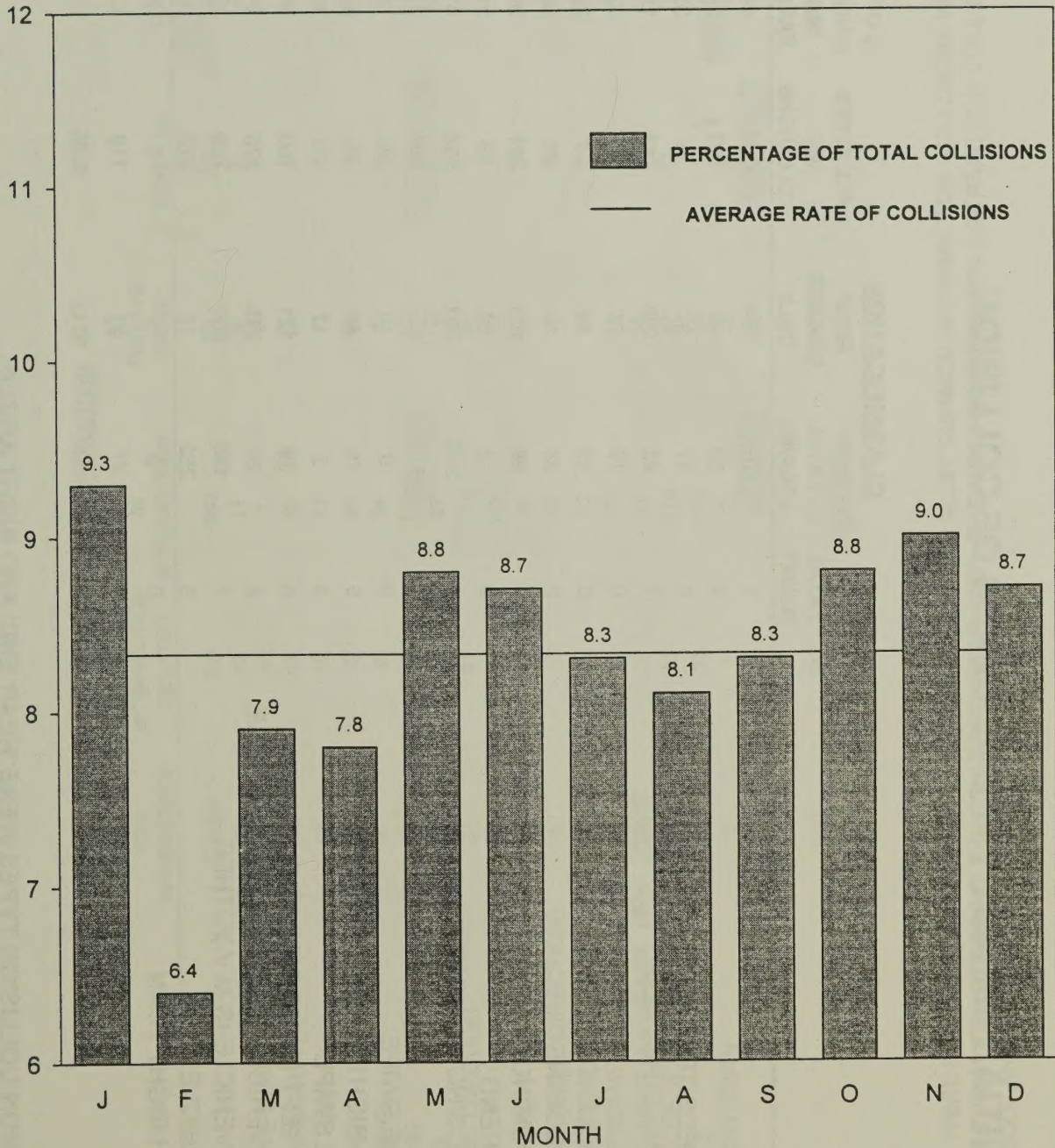


Exhibit 1.4

SELECTED
CHARACTERISTICS

COLLISIONS vs MONTH OF THE YEAR



**THE HIGHEST PERCENTAGE OF COLLISIONS
OCCURRED IN THE MONTHS OF JANUARY
AND NOVEMBER.**



INITIAL IMPACT TYPE vs CLASS OF COLLISION

Exhibit 1.5

INITIAL IMPACT TYPE (a)	CLASSIFICATION				ALL TYPES OF COLLISIONS	% OF TYPE INVOLVING INJURY/ FATALITY
	FATAL INJURY	NON- FATAL INJURY	PROP. DAMAGE ONLY			
REAR END	1	576	734		1311	44%
HEAD ON	4	50	46		100	54%
SIDE SWIPE (OPPOSITE DIRECTION)	0	17	37		55	32%
SIDE SWIPE (SAME DIRECTION)	1	43	198		243	19%
OVERTAKING	0	19	74		93	21%
RIGHT TURN REAREND	0	13	48		61	22%
RIGHT TURN ONCOMING	0	24	18		42	58%
LEFT TURN ONCOMING	0	98	183		281	35%
LEFT TURN REAREND	0	15	54		68	21%
LEFT TURN OPPOSING THROUGH	1	205	302		508	41%
RIGHT ANGLE	3	413	467		883	47%
RIGHT TURN SIDE SWIPE	0	0	10		10	2%
THROUGH WITH RIGHT (SAME DIRECTION)	0	15	40		55	27%
LEFT TURN SIDE SWIPE	0	3	17		20	13%
THROUGH WITH LEFT (SAME DIRECTION)	0	39	121		160	24%
SINGLE MOTOR VEHICLE (S.M.V.)/PARKED VEHICLE	2	28	245		276	11%
SINGLE MOTOR VEHICLE (S.M.V.)/OTHER	1	195	509		705	28%
PEDESTRIAN/VEHICLE	5	252	15		272	94%
LEFT TURN WITH RIGHT TURN	0	0	3		3	7%
OTHER	0	27	91		118	23%
TOTAL	21	2032	3212		5265	

THE MOST COMMON COLLISION TYPES WERE 'REAR END' AND 'RIGHT ANGLE'.

INJURIES/FATALITIES WERE MOST LIKELY TO OCCUR IN "PEDESTRIAN/VEHICLE" & "HEAD ON" COLLISIONS.

THE HIGHEST NUMBER OF INJURIES WERE IN 'REAR END' AND 'RIGHT ANGLE' COLLISIONS.

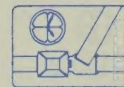
(a) The traffic movements causing these collisions are shown diagrammatically on the chart in Appendix A.1.

INITIAL IMPACT TYPE vs ROAD CLASSIFICATION

INITIAL IMPACT TYPE	ROAD LOCATION					TOTAL
	NON- INTERSECTION	INTERSECTION RELATED	IN INTERSECTION	AT PRIVATE DRIVE	OTHER (a)	
REAR END	509	337	360	92	13	1312
HEAD ON	74	10	11	4	2	101
SIDE SWIPE (OPPOSITE DIRECTION)	45	6	3	1	1	56
SIDE SWIPE (SAME DIRECTION)	140	35	52	13	2	242
OVERTAKING	56	16	13	7	0	92
RIGHT TURN REAREND	11	12	25	13	0	61
RIGHT TURN ONCOMING	4	8	24	5	0	42
LEFT TURN ONCOMING	30	40	130	82	0	282
LEFT TURN REAREND	8	19	27	14	0	68
LEFT TURN OPPOSING THROUGH	27	81	345	54	1	508
RIGHT ANGLE	27	173	634	46	3	883
RIGHT TURN SIDE SWIPE	0	4	6	0	0	10
THROUGH WITH RIGHT (SAME DIRECTION)	8	10	19	18	0	55
LEFT TURN SIDE SWIPE	0	7	12	1	0	20
THROUGH WITH LEFT (SAME DIRECTION)	29	29	76	25	0	160
SINGLE MOTOR VEHICLE (S.M.V.)/PARK. VEH.	200	20	17	35	2	274
SINGLE MOTOR VEHICLE (S.M.V.)/OTHER	431	76	110	47	43	708
PEDESTRIAN/VEHICLE	81	51	125	15	1	273
LEFT TURN WITH RIGHT TURN	0	1	2	0	0	3
OTHER (a)	47	14	20	36	2	119
		0	0	0	0	0
TOTAL	1727	947	2014	511	77	5269
%	32.8%	18.0%	38.2%	9.7%	1.5%	100.0%

56% OF COLLISIONS WERE IN, OR ASSOCIATED WITH INTERSECTIONS. THE MOST COMMON INTERSECTION COLLISIONS WERE RIGHT ANGLE; LEFT TURN WITH 'OPPOSING THROUGH' AND 'REAR END'. THE MOST COMMON NON-INTERSECTION COLLISIONS WERE SINGLE MOTOR VEHICLE AND 'REAR END'.

(a) "OTHER" includes 'at railroad', 'underpass or tunnel', 'overpass or bridge' and 'other'.



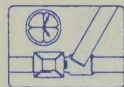


Exhibit 1.7

INITIAL IMPACT TYPE vs TYPE OF TRAFFIC CONTROL

TYPE OF TRAFFIC CONTROL AT LOCATION (a)

INITIAL IMPACT TYPE	TRAFFIC SIGNAL	STOP SIGN	YIELD SIGN	POLICE CONTROL	SCHOOL GUARD	SCHOOL BUS	TRAFFIC GATE	TRAFFIC CONTROL PERSON*	NO TRAFFIC CONTROL	OTHER	TOTAL
REAR END	348	203	20	1	2	1	0	2	733	2	1312
HEAD ON	5	11	1	0	0	0	0	0	83	0	100
SIDE SWIPE (OPPOSITE DIRECTI	2	5	0	0	0	0	0	0	48	0	55
SIDE SWIPE REAR	45	33	1	1	0	0	0	1	163	0	243
OVERTAKING	13	11	1	0	0	0	0	0	68	1	93
RIGHT TURN REAR END	16	21	1	0	0	0	0	0	23	0	61
RIGHT TURN ONCOMING	16	17	0	0	0	0	0	0	9	0	42
LEFT TURN ONCOMING	36	135	0	0	0	0	0	0	110	0	282
LEFT TURN REAR END	17	26	1	1	0	0	0	0	24	0	68
LEFT TURN OPPOSING THROUGH	339	88	0	0	0	0	0	0	81	0	508
RIGHT ANGLE	405	405	1	1	0	0	0	1	68	2	883
RIGHT TURN SIDE SWIPE	9	1	0	0	0	0	0	0	1	0	10
THRU. WITH RIGHT (SAME DIREC	18	10	0	0	0	0	0	0	27	0	55
LEFT TURN SIDE SWIPE	16	1	0	0	0	0	0	0	3	0	20
THRU. WITH LEFT (SAME DIRECT'	65	40	0	0	0	0	0	0	54	0	160
S.M.V./PARKED VEHICLE	5	33	0	0	0	0	0	0	236	1	274
S.M.V./OTHER	66	108	3	1	0	0	2	1	524	2	708
PEDESTRIAN/VEHICLE	106	63	1	0	0	0	0	0	103	0	273
LEFT TURN WITH RIGHT TURN	2	0	1	0	0	0	0	0	0	0	3
OTHER	12	18	0	0	0	0	0	0	88	0	119
TOTAL	1540	1230	30	4	3	2	2	5	2443	10	5269
%	29.2%	23.3%	0.6%	0.1%	0.1%	0.0%	0.0%	0.1%	46.4%	0.2%	100.0%

46% OF ALL COLLISIONS OCCURRED AT LOCATIONS WITH NO TRAFFIC CONTROL. THE MOST COMMON COLLISION TYPE AT A TRAFFIC SIGNAL WAS 'RIGHT ANGLE'. THE MOST COMMON COLLISION TYPE AT A STOP SIGN WAS 'RIGHT ANGLE'.

(a) Includes all collisions at both intersection and non-intersection locations.

* Any person directing traffic who is not a police officer or school crossing guard.



Chapter Two

Drivers



Chapter 2

Driver Age

Although persons under the age of 25 make up only 14 percent of the licensed driving population, this age group was represented by 19.1 percent of drivers reported in collisions in 1997 through 1999. (Exhibit 2.1).

Drivers over the age of 64, involved in a collision, were recorded as driving properly only 42.2 percent of the time. The most frequent improper driving action recorded for this group was "failed to yield right-of-way" (Exhibit 2.2).

Drinking Drivers

Drinking drivers were involved in 5.0 percent of all reported collisions (Exhibit 2.3). Drinking drivers were involved in 12.5 percent of fatal collisions and 6.8 percent of injury collisions. While in 1985 there was a one-third greater chance of an injury occurring in a collision which involved a driver who had consumed alcohol than in a collision in which all drivers were sober, there was a slightly lower probability (36% versus 38%) in 1997-1999. However, in 1997-1999, there was double the chance that a drinking driver would be involved in a fatal collision (0.8% versus 0.4%).

Exhibit 2.4 indicates that 60 percent of collisions involving alcohol occurred during the period from 8 p.m. to 3 a.m.

Exhibit 2.5 indicates that only 11 percent of the drivers involved in collisions who admitted to alcohol consumption but were not legally impaired, were driving properly. Only 3.6 percent of drivers who were legally impaired due to alcohol were recorded as driving properly at the time of the collision. The most frequently indicated improper driver action was loss of control of the vehicle.

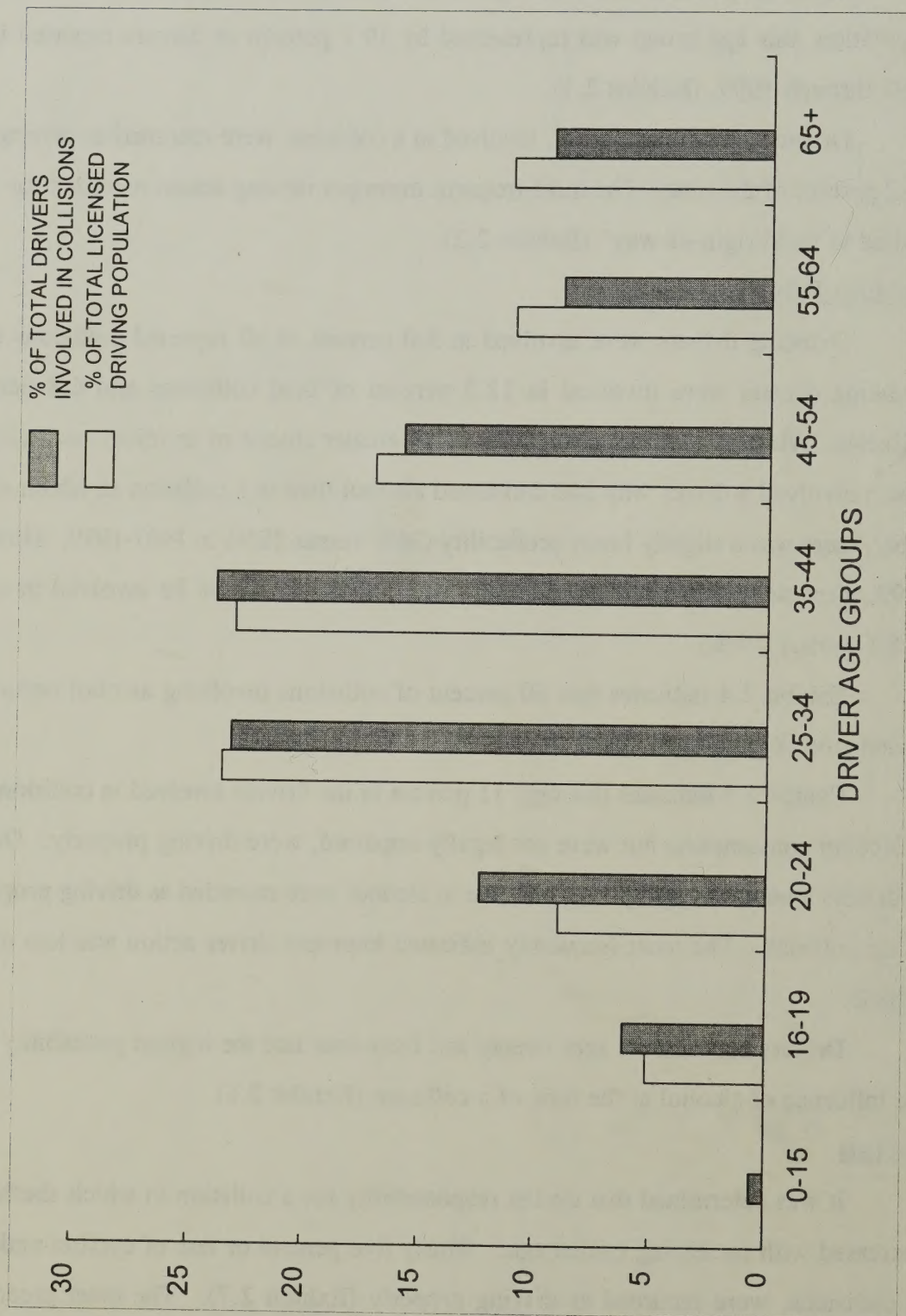
Drivers between the ages twenty and forty-four had the highest probability of being under the influence of alcohol at the time of a collision (Exhibit 2.6).

Cyclists

It was determined that cyclist responsibility for a collision in which she/he was involved decreased with increasing cyclist age. Thirty five percent or less of cyclists under 19, involved in collisions, were recorded as driving properly (Exhibit 2.7). The most predominant known cyclist improper action indicated was failure to yield right-of-way.



MOTOR VEHICLE DRIVER AGE vs COLLISION INVOLVEMENT



DRIVERS UNDER 24 YEARS OF AGE ARE INVOLVED IN MORE COLLISIONS THAN EXPECTED BASED ON THE AGE DISTRIBUTION OF THE LICENSED POPULATION OF ONTARIO

Exhibit 2.1



Exhibit 2.2

MOTOR VEHICLE DRIVER AGE vs DRIVER ACTION

DRIVER AGE

DRIVER ACTION	0-15	16-19	20-24	25-34	35-44	45-54	55-64	65-74	75+	TOTAL	% OF ALL ACTIONS
DRIVING PROPERLY	8	173	488	1065	1213	824	436	263	107	4577	49.0%
FOLLOWING TOO CLOSE	1	66	147	230	215	132	57	35	27	910	9.7%
EXCEEDING SPEED LIMIT	1	7	13	12	9	3	2	1	0	48	0.5%
SPEED TOO FAST	0	20	23	36	30	13	10	3	3	139	1.5%
SPEED TOO SLOW	0	0	1	0	1	0	0	0	0	2	0.0%
IMPROPER TURN	3	35	63	106	95	68	55	50	34	509	5.5%
DISOBEYED TRAFFIC CONTROL	11	37	76	127	104	77	45	34	24	536	5.7%
FAILED TO YIELD R.O.W.	11	65	130	218	218	146	105	87	68	1049	11.2%
IMPROPER PASSING	0	2	8	10	13	14	6	1	2	57	0.6%
LOST CONTROL	6	64	119	161	135	84	36	25	23	653	7.0%
WRONG WAY ON ONE-WAY	3	3	6	5	6	3	1	1	1	28	0.3%
IMPROPER LANE CHANGE	1	15	25	54	47	30	23	18	12	224	2.4%
OTHER	10	39	71	145	144	82	55	33	25	604	6.5%
TOTAL	55	527	1170	2169	2231	1477	831	550	326	9336	100.0%
% DRIVERS INVOLVED DRIVING PROPERLY (a)	17.6%	35.5%	44.4%	52.6%	58.1%	59.1%	56.3%	50.7%	35.4%	45.5%	

DRIVERS

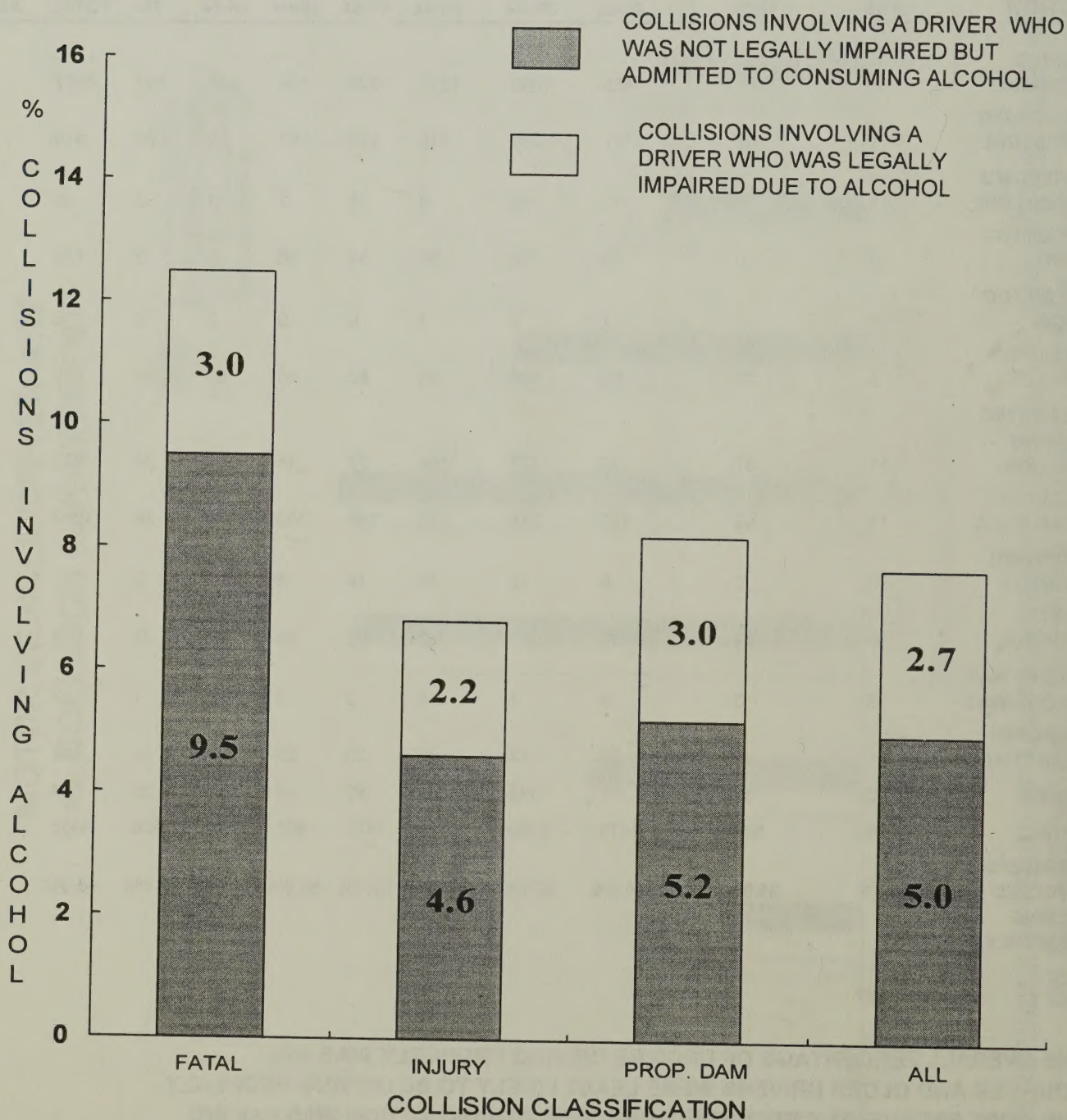
THE OVERALL PERCENTAGE OF DRIVERS DRIVING PROPERLY WAS 45%.
YOUNGER AND OLDER DRIVERS WERE LEAST LIKELY TO BE DRIVING PROPERLY.
THE MOST FREQUENTLY RECORDED IMPROPER DRIVING ACTION WAS FAILING TO YIELD RIGHT-OF-WAY.

(a) Excluding "Other".



Exhibit 2.3

ALCOHOL INVOLVEMENT vs COLLISION CLASSIFICATION



5.0% OF ALL COLLISIONS INVOLVED A DRIVER WHO HAD CONSUMED ALCOHOL.



Exhibit 2.4

TIME OF DAY AND DAY OF WEEK

TIME OF DAY	DAY OF WEEK							TOTAL
	MON	TUES	WED	THUR	FRI	SAT	SUN	
12-1 a.m.	1	2	2	3	3	6	6	22
1-2 a.m.	1	1	1	2	3	7	9	24
2-3 a.m.	2	1	3	4	5	9	10	33
3-4 a.m.	1	0	1	0	3	5	3	13
4-5 a.m.	0	1	0	0	2	1	2	6
5-6 a.m.	0	0	0	0	0	1	1	1
6-7 a.m.	0	0	1	0	0	0	0	1
7-8 a.m.	0	0	0	0	0	0	1	2
8-9 a.m.	0	1	0	0	0	0	0	2
9-10 a.m.	0	0	0	0	0	0	0	0
10-11 a.m.	0	0	0	1	0	0	0	1
11-12 noon	0	1	0	1	1	1	0	3
12-1 p.m.	0	0	0	1	0	1	0	3
1-2 p.m.	0	1	1	0	0	0	0	3
2-3 p.m.	0	0	0	1	2	1	2	7
3-4 p.m.	1	0	1	1	1	2	0	6
4-5 p.m.	2	2	1	1	1	2	2	11
5-6 p.m.	2	1	1	2	3	2	3	13
6-7 p.m.	2	3	1	2	2	3	4	16
7-8 p.m.	3	2	3	2	1	3	4	16
8-9 p.m.	1	2	3	2	4	4	4	20
9-10 p.m.	2	2	5	3	4	3	3	22
10-11 p.m.	2	2	2	2	4	4	2	18
11-12 midnight	2	3	1	2	4	7	2	21
UNKNOWN	1	0	0	0	0	1	0	3
TOTAL	24	24	27	28	43	63	58	268

**MOST COLLISIONS INVOLVING ALCOHOL OCCURRED IN THE EVENING
FROM 8 p.m. TO 3 a.m.**



Exhibit 2.5

DRIVER ACTION vs

DRIVER CONDITION

DRIVER ACTION	DRIVER CONDITION				
	NORMAL	HAD BEEN DRINKING (a)	IMPAIRED- ALCOHOL OVER .08 (b)	IMPAIRED- ALCOHOL (c)	IMPAIRED- DRUGS (d)
DRIVING PROPERLY	4488	12	3	1	1
FOLLOWING TOO CLOSE	790	11	9	2	0
EXCEEDING SPEED LIMIT	33	5	4	2	0
SPEED TOO FAST	113	5	4	1	0
SPEED TOO SLOW	3	0	0	0	0
IMPROPER TURN	453	4	4	1	0
DISOBEYED TRAFFIC CONTROL	441	13	12	3	0
FAILED TO YIELD R.O.W.	960	8	4	2	1
IMPROPER PASSING	47	1	1	1	0
LOST CONTROL	460	46	38	15	3
WRONG WAY ON ONE-WAY	19	3	3	0	0
IMPROPER LANE CHANGE	191	3	2	1	0
OTHER	458	15	23	10	2
TOTAL	8456	127	107	38	6
% DRIVERS INVOLVED DRIVING PROPERLY (e)	56.1%	11.0%	3.6%	3.6%	25.0%

11% OF DRIVERS WHO HAD BEEN DRINKING AND 7.2% OF DRIVERS WHO WERE IMPAIRED DUE TO ALCOHOL WERE RECORDED AS DRIVING PROPERLY AT THE TIME OF THE COLLISION.

(a) Driver had consumed alcohol but their physical condition was not legally impaired.

(b) Driver had consumed alcohol and upon testing was found to have a blood-alcohol level in excess of 80 mg.



DRIVER CONDITION

MEDICAL						
FATIGUE	DISABILITY	INATTENTIVE	UNKNOWN	OTHER	TOTAL	%
1	0	5	129	5	4645	48.9%
1	1	4	80	4	902	9.5%
0	0	1	11	1	56	0.6%
1	1	2	14	2	142	1.5%
0	0	0	0	0	3	0.0%
1	4	1	31	1	500	5.3%
1	1	4	42	4	520	5.5%
0	0	4	70	4	1052	11.1%
0	0	1	11	1	63	0.7%
9	10	12	111	12	714	7.5%
0	0	1	3	1	30	0.3%
0	0	2	22	2	224	2.4%
5	8	15	94	15	646	6.8%
20	25	51	616	51	9497	100.0%
6.7%	0.0%	13.9%	24.7%	13.9%	52.5%	

- (c) Driver had consumed sufficient alcohol to warrant being charged with a drinking and driving offence in the judgement of the investigating officer.
- (d) Driver had used drugs and was legally impaired in the judgement of the investigating officer.
- (e) Excluding not known and other.



Exhibit 2.6

DRIVER AGE vs DRIVER CONDITION

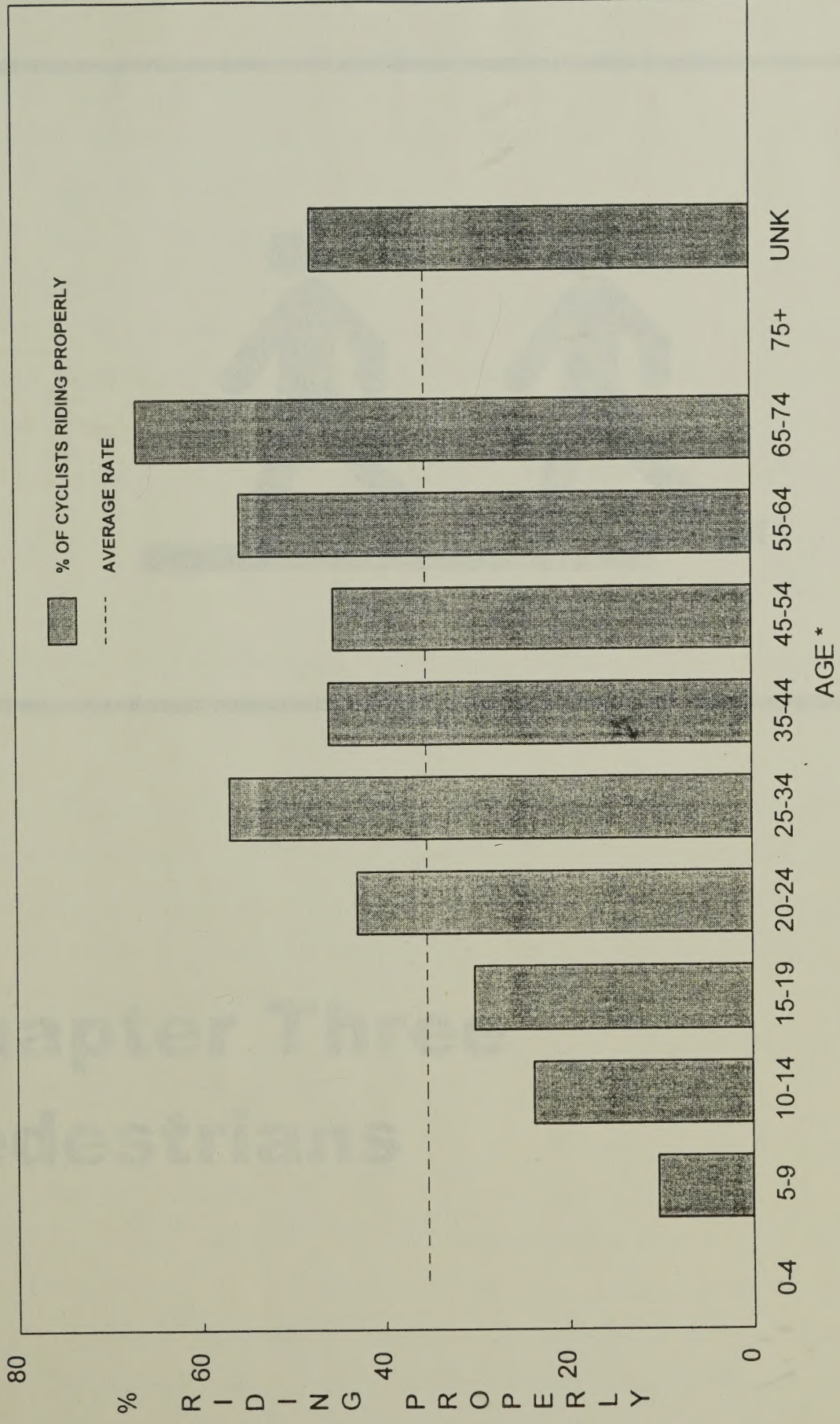
DRIVER CONDITION	DRIVER AGE										NO		TOTAL	%
	0-15	16-19	20-24	25-34	35-44	45-54	55-64	65-74	75+	DRIVER	UNKNOWN			
NORMAL	42	465	663	1925	1983	1329	745	500	280	0	150	8080	86.8%	
HAD BEEN DRINKING	0	5	9	37	31	15	8	4	1	0	7	117	1.3%	
IMPAIRED- ALCOHOL OVER .08	0	3	6	25	34	22	6	2	2	0	2	101	1.1%	
IMPAIRED- ALCOHOL	0	3	4	11	10	7	3	1	0	0	1	39	0.4%	
IMPAIRED- DRUGS	0	0	1	2	2	0	0	0	0	0	1	5	0.1%	
FATIGUE	0	2	2	4	4	3	1	0	1	0	0	18	0.2%	
MEDICAL DISABILITY	0	0	0	2	6	6	3	2	4	0	0	23	0.3%	
INATTENTIVE	7	20	24	60	53	38	26	16	20	0	7	271	2.9%	
NOT KNOWN	6	26	32	94	103	52	36	22	16	0	219	607	6.5%	
OTHER	0	4	5	9	7	4	4	2	2	0	14	50	0.5%	
TOTAL	55	528	746	2168	2231	1477	830	550	326	0	401	9311	100.0%	
% DRINKING DRIVERS INVOLVED (a)	0.0%	2.0%	2.6%	3.5%	3.5%	3.1%	2.1%	1.4%	1.0%	0.0%		6.1%		

DRIVERS IN THE AGE GROUP 20 TO 44 WERE MOST LIKELY TO HAVE CONSUMED ALCOHOL BEFORE
BEING INVOLVED IN A COLLISION.

(a) Excluding not known and other.



**CYCLIST ACTIONS IN MOTOR VEHICLE COLLISIONS:
PERCENTAGE RIDING PROPERLY vs AGE GROUP**



**THE 5 TO 9 YEAR OLD AGE GROUP HAD THE
POOREST RIDING PERFORMANCE.**

*No cyclists were recorded in the 0-4 and over 75 age groups

DRIVERS



1997-1999 Hamilton-Wentworth Collision Report Volume 2

DRIVERS

DRIVERS



Chapter Three

Pedestrians



Chapter 3

General – Pedestrian Collisions

On average, from 1997-1999, there were 287 pedestrian collisions resulting in 291 pedestrian injuries and 6 pedestrian fatalities.

Pedestrian Age

The relationship between the Regional population distribution and pedestrian involvement in collisions from 1997 to 1999 was reviewed (Exhibit 3.1). It was determined that pedestrians between the ages of 5 and 24 and over 75 years of age were over-represented in pedestrian collisions when compared to the age distribution of the Regional population.

Pedestrian Action

Exhibit 3.2 shows the pedestrian actions at the time of the collisions versus pedestrian age. In general, the instances of unsafe pedestrian action were greatest for pedestrians 5-14 years of age.

This exhibit also indicates that the actions of crossing a signalized intersection without the right-of-way accounted for 17.5 percent of pedestrian actions at the time of the collision. These unsafe actions are particularly associated with pedestrians under 15 years of age.

In 37.2 percent of all pedestrian collisions the pedestrian was involved in an unsafe action (e.g. crossing illegally at a traffic signal).

The data for pedestrian collisions at traffic signals indicates that in 79% of cases, the pedestrian was not at fault (Exhibit 3.3).

Time of Pedestrian Collisions

The time of day when collisions occurred was compared to the number of pedestrians injured (Exhibit 3.4).

Eleven percent of pedestrians were injured in collisions which occurred between 4 p.m. and 5 p.m. Exhibit 3.5 compares the time of day of pedestrian collisions with pedestrian age.



Pedestrian Condition

In most cases, the condition of the pedestrian (Exhibit 3.6) involved in the collision was reported as normal (71% of the time). However, in 7.6 percent of the collisions involving pedestrians, the pedestrian admitted to alcohol consumption or was legally impaired.

Location

Exhibit 3.7 examines the type of traffic control at locations where pedestrian collisions occurred. 44 percent of the pedestrian collisions, occurred at a non-intersection location with no traffic control. 37 percent of pedestrian collisions, occurred at a traffic signal controlled intersection, and 17 percent of collisions occurred at a stop sign controlled intersection.

Driver Action

Exhibit 3.8 indicates that in 59 percent of the motor vehicle/pedestrian collisions, the driver was recorded as driving properly. This figure does not necessarily suggest that the drivers involved in these collisions were totally without blame but does indicate that a majority of pedestrian collisions are associated with improper pedestrian action or lack of awareness of traffic conditions at the time of the collision.

Of the 41 percent of motor vehicle/pedestrian collisions in which the driver was not driving properly, the most frequently recorded driver action was "failing to yield the right-of-way" (associated with 23.2% of all motor vehicle - pedestrian collisions).

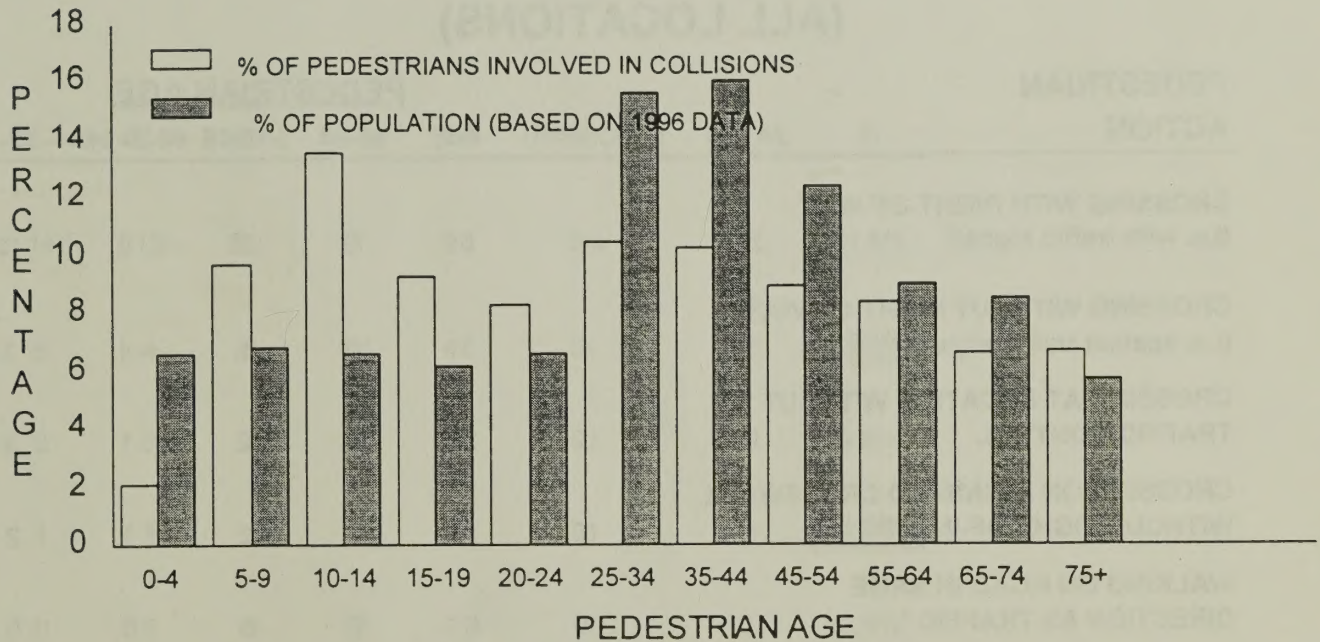
Pedestrian Injuries

Most pedestrians (88%) suffered no, minimal or minor injuries when involved in a collision.

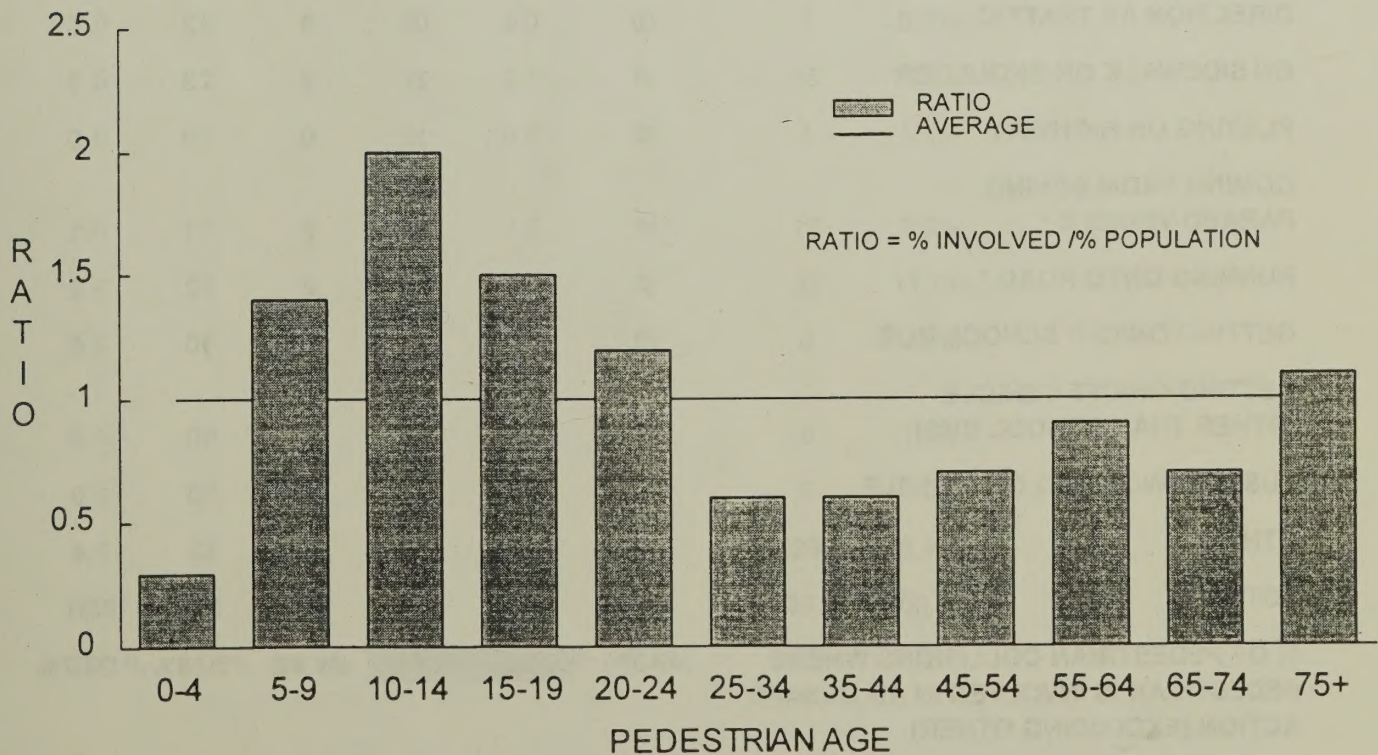


Exhibit 3.1

PEDESTRIAN AGE vs COLLISION INVOLVEMENT



*There were 15 pedestrian collisions where age was not recorded



PEDESTRIANS FROM 5 TO 24 YEARS AND OVER 75 YEARS OF AGE ARE OVER-REPRESENTED IN PEDESTRIAN COLLISIONS.



Exhibit 3.2

PEDESTRIAN AGE vs PEDESTRIAN ACTION (ALL LOCATIONS)

PEDESTRIAN ACTION	PEDESTRIAN AGE					
	0-4	5-9	10-14	15-19	20-24	25-34
CROSSING WITH RIGHT-OF-WAY (i.e. with traffic signal)	6	6	7	10	9	12
CROSSING WITHOUT RIGHT-OF-WAY * (i.e. against traffic signal)	0	3	10	5	4	3
CROSSING AT LOCATION WITHOUT TRAFFIC CONTROL	2	2	3	2	1	3
CROSSING ON A MARKED CROSSWALK, WITHOUT RIGHT-OF-WAY	0	1	1	2	1	2
WALKING ON ROAD IN SAME DIRECTION AS TRAFFIC *	0	0	0	0	0	0
WALKING ON ROAD IN OPPOSITE DIRECTION AS TRAFFIC	0	0	0	1	2	0
ON SIDEWALK OR SHOULDER	1	1	2	3	3	3
PLAYING ON HIGHWAY *	0	2	1	0	0	0
COMING FROM BEHIND PARKED VEHICLE *	1	3	2	2	1	1
RUNNING ONTO ROAD *	1	11	11	2	2	2
GETTING ON/OFF SCHOOL BUS	0	0	0	0	0	0
GETTING ON/OFF VEHICLE (OTHER THAN SCHOOL BUS)	0	1	1	1	0	0
PUSHING/WORKING ON VEHICLE	0	0	0	0	0	0
OTHER	1	2	2	2	2	4
TOTAL	12	32	41	29	24	31
% OF PEDESTRIAN COLLISIONS WHERE PEDESTRIAN IS INVOLVED IN AN UNSAFE ACTION (EXCLUDING OTHER)	24.2%	62.2%	62.6%	34.1%	29.4%	24.7%

THE INSTANCES OF UNSAFE PEDESTRIAN ACTIONS WERE HIGHEST
FOR THE 5-14 YEAR OLD GROUP.

* Actions considered unsafe



35-44	45-54	55-64	65-74	75+	UNKNOWN	TOTAL	%
14	12	13	8	9	10	106	31.9%
5	4	6	5	4	4	58	17.5%
2	6	2	4	2	0	32	9.6%
1	1	1	2	1	0	15	4.5%
0	0	0	0	0	0	2	0.6%
0	0	1	0	0	0	1	0.3%
5	2	2	2	3	1	35	10.5%
0	1	0	0	0	0	4	1.2%
0	1	1	0	1	0	12	3.6%
4	1	0	0	0	2	39	11.7%
0	0	0	0	0	0	0	0.0%
1	0	0	0	0	0	5	1.5%
0	0	0	0	0	0	0	0.0%
4	3	2	1	0	2	23	6.9%
36	31	27	22	21	21	332	100.0%
27.1%	24.1%	26.3%	23.8%	27.9%	35.1%	37.2%	

22% OF PEDESTRIANS INVOLVED IN COLLISIONS CROSSED WITHOUT RIGHT OF WAY.



Exhibit 3.3

PEDESTRIAN AGE vs PEDESTRIAN ACTION (AT TRAFFIC SIGNALS)*

PEDESTRIAN ACTION	PEDESTRIAN AGE					
	0-4	5-9	10-14	15-19	20-24	25-34
CROSSING WITH RIGHT-OF-WAY (i.e. with traffic signal)	2	3	4	6	4	6
CROSSING WITHOUT RIGHT-OF-WAY ** (i.e. against traffic signal)	0	3	3	2	1	0
CROSSING AT LOCATION WITHOUT TRAFFIC CONTROL	0	0	0	0	0	0
CROSSING ON A MARKED CROSSWALK, WITHOUT RIGHT-OF-WAY	1	0	1	1	1	0
WALKING ON ROAD IN THE SAME DIRECTION AS TRAFFIC **	0	0	0	0	0	0
WALKING ON ROAD IN OPPOSITE DIRECTION AS TRAFFIC	0	0	0	0	0	0
ON SIDEWALK OR SHOULDER	0	0	0	0	1	0
PLAYING ON HIGHWAY **	0	0	0	0	0	0
COMING FROM BEHIND PARKED VEHICLE **	0	0	0	0	0	0
RUNNING ONTO ROAD **	0	2	1	1	1	1
GETTING ON/OFF VEHICLE (OTHER THAN SCHOOL BUS)	0	0	0	0	0	0
PUSHING/WORKING ON VEHICLE	0	0	0	0	0	0
OTHER	0	1	1	0	1	1
TOTAL	3	9	10	10	9	7
% OF PEDESTRIAN COLLISIONS WHERE PEDESTRIAN IS INVOLVED IN AN UNSAFE ACTION (EXCLUDING OTHER)	0%	62.5%	44.0%	30.0%	25.0%	17.0%

PEDESTRIANS BETWEEN THE AGES OF 5 AND 9 WERE MORE LIKELY THAN OTHER AGE GROUPS TO BE INVOLVED IN COLLISIONS WHICH OCCURRED AT TRAFFIC SIGNALS DUE TO UNSAFE ACTIONS.

*All collisions within 9 meters of the intersection are considered for this analysis

**Actions considered unsafe

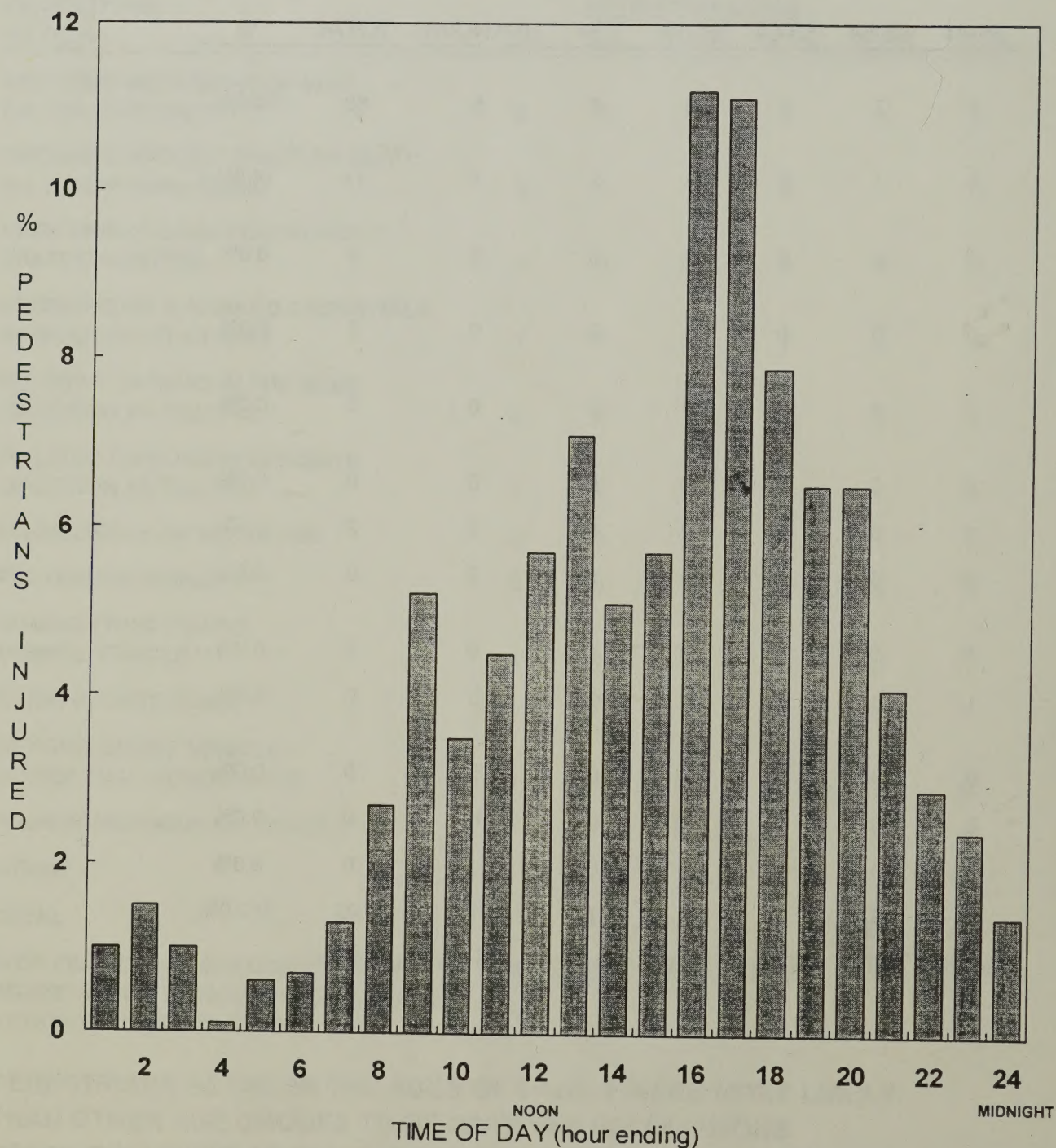


35-44	45-54	55-64	65-74	75+	UNKNOWN	TOTAL	%
7	7	8	4	6	5	62	64.8%
1	1	0	1	1	1	14	14.6%
0	0	0	0	0	0	0	0.0%
0	0	0	1	0	0	5	5.2%
0	0	0	0	0	0	0	0.0%
0	0	0	0	0	0	0	0.0%
1	0	0	0	0	0	2	2.1%
0	0	0	0	0	0	0	0.0%
0	0	0	0	0	0	0	0.0%
1	0	0	0	0	0	6	6.6%
0	0	0	0	0	0	0	0.0%
0	0	0	0	0	0	0	0.0%
0	0	1	0	0	1	6	6.6%
10	8	9	6	7	7	96	100.0%
20.0%	12.5%	0.0%	16.6%	14.3%	16.6%	21.3%	



Exhibit 3.4

TIME OF DAY vs NUMBER OF PEDESTRIANS INJURED



THE HIGHEST NUMBER OF PEDESTRIAN
COLLISIONS OCCURRED BETWEEN THE HOURS OF
4 p.m. - 5 p.m.



Exhibit 3.5

TIME OF DAY vs PEDESTRIAN AGE**PEDESTRIAN AGE**

TIME OF DAY	0-4	5-9	10-14	20-24	25-34	35-44	45-54	55-64	65-74	75+	U/K	TOTAL
12-1 a.m.	0	0	0	2	0	1	0	0	0	0	0	5
1-2 a.m.	0	0	0	3	3	1	0	0	0	0	1	8
2-3 a.m.	0	0	0	0	2	0	0	0	0	0	0	2
3-4 a.m.	0	0	0	0	0	0	0	0	0	0	0	0
4-5 a.m.	0	0	0	0	0	1	0	0	0	0	0	1
5-6 a.m.	0	0	0	0	0	0	0	0	0	0	0	0
6-7 a.m.	0	0	0	0	2	0	0	0	0	0	0	2
7-8 a.m.	0	0	1	0	1	2	1	0	1	0	1	7
8-9 a.m.	2	3	4	1	0	2	1	0	0	0	1	15
9-10 a.m.	0	0	0	1	4	2	0	3	0	2	1	12
10-11 a.m.	1	2	0	1	0	0	0	1	1	0	0	6
11-12 NOON	0	2	0	0	1	3	0	0	5	1	1	13
12-1 p.m.	2	4	6	0	6	3	0	3	4	0	2	29
1-2 p.m.	0	0	0	1	4	2	2	2	2	1	0	16
2-3 p.m.	2	1	0	0	0	1	0	4	3	2	0	15
3-4 p.m.	1	8	11	1	2	2	2	2	0	1	0	36
4-5 p.m.	1	6	7	3	1	1	1	2	4	0	1	28
5-6 p.m.	1	6	5	3	0	0	3	0	3	2	2	25
6-7 p.m.	0	3	7	1	0	3	1	1	0	1	1	19
7-8 p.m.	1	4	1	0	2	1	1	3	4	0	1	17
8-9 p.m.	0	2	3	1	1	2	1	0	1	0	3	13
9-10 p.m.	0	1	0	0	1	3	2	2	2	0	1	11
10-11 p.m.	0	0	0	0	3	0	1	0	0	0	1	5
MIDNIGHT	0	0	0	0	1	0	1	0	1	0	0	5
UNKNOWN	0	0	0	0	0	0	0	1	0	0	0	1
TOTAL	11	42	45	18	34	30	17	24	31	10	17	308

PEDESTRIANS

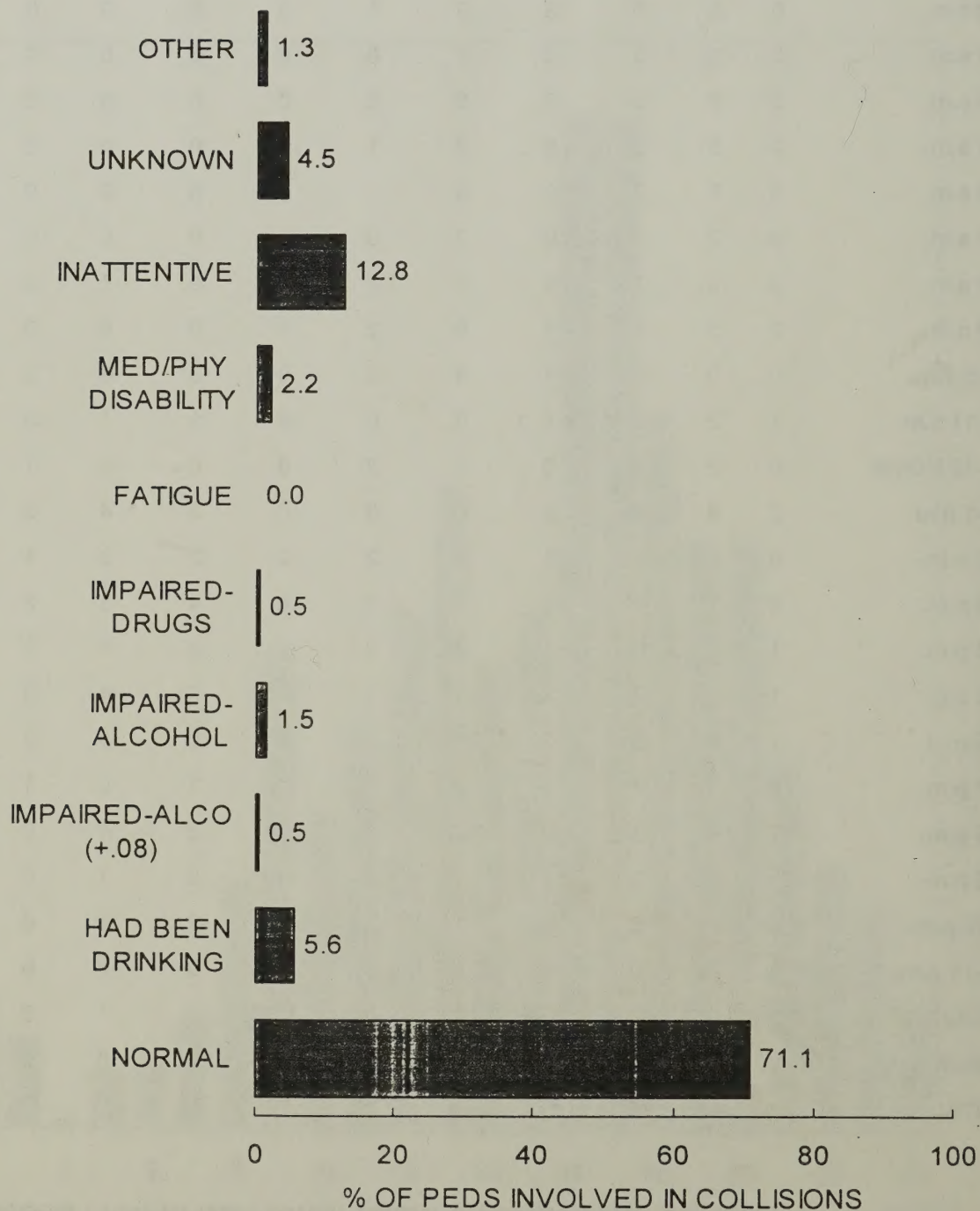
**22% OF PEDESTRIANS WERE INVOLVED IN COLLISIONS THAT
OCCURRED BETWEEN THE HOURS OF 3 p.m. - 5 p.m.**



Exhibit 3.6

CONDITION OF PEDESTRIANS INVOLVED IN COLLISIONS

CONDITION

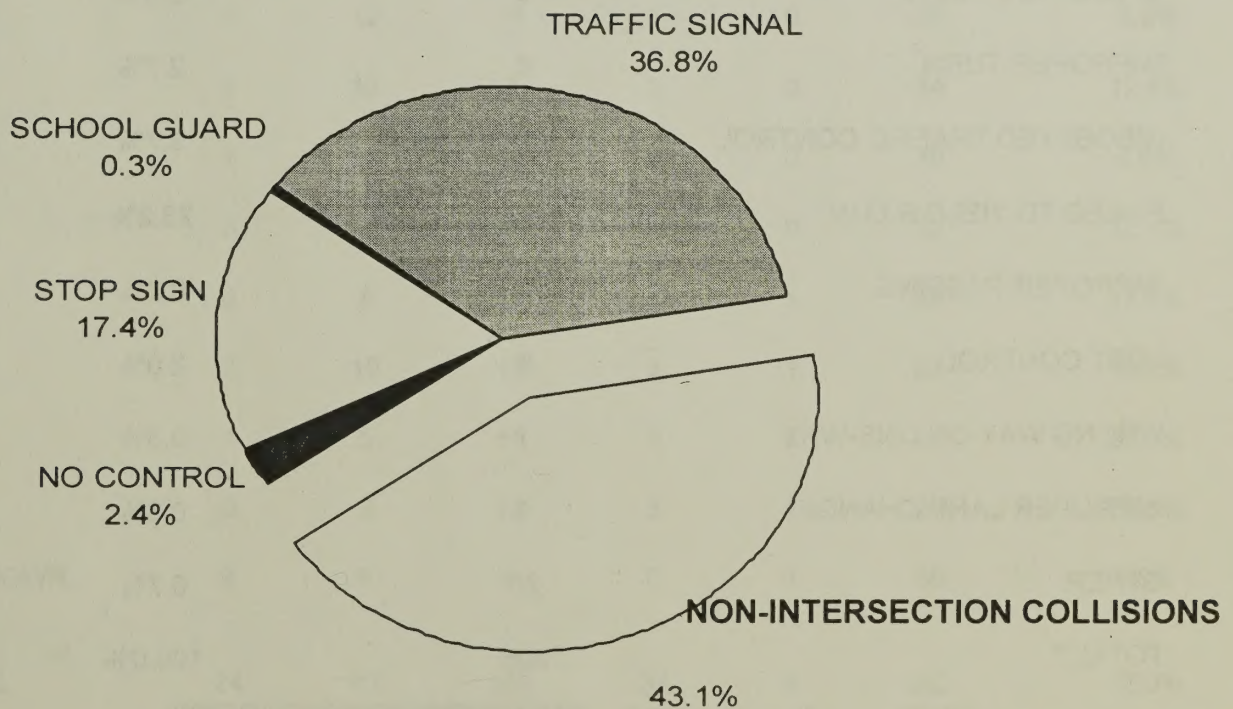


**7.6% OF PEDESTRIANS INVOLVED IN
COLLISIONS HAD CONSUMED ALCOHOL.**



TYPE OF TRAFFIC CONTROL AT LOCATIONS WHERE PEDESTRIAN COLLISIONS OCCURED

COLLISIONS IN AN INTERSECTION



PEDESTRIANS

PEDESTRIANS ARE MOST LIKELY TO BE INVOLVED IN A COLLISION AT A NON-INTERSECTION LOCATION. THE MOST COMMON TYPE OF TRAFFIC CONTROL AT AN INTERSECTION, FOR PEDESTRIAN COLLISIONS, IS TRAFFIC SIGNAL.



DRIVER ACTION IN PEDESTRIAN COLLISIONS

ACTION	NUMBER OF DRIVERS INVOLVED	PERCENTAGE
DRIVING PROPERLY	176	59.1%
FOLLOWING TOO CLOSE	2	0.7%
EXCEEDING SPEED LIMIT	1	0.3%
SPEED TOO FAST FOR CONDITIONS	2	0.7%
SPEED TOO SLOW	0	0.0%
IMPROPER TURN	8	2.7%
DISOBEYED TRAFFIC CONTROL	11	3.7%
FAILED TO YIELD R.O.W.	69	23.2%
IMPROPER PASSING	1	0.3%
LOST CONTROL	6	2.0%
WRONG WAY ON ONE-WAY	1	0.3%
IMPROPER LANE CHANGE	1	0.3%
OTHER	20	6.7%
TOTAL *	298	100.0%

59% OF THE MOTOR VEHICLE DRIVERS INVOLVED IN PEDESTRIAN COLLISIONS WERE RECORDED AS DRIVING PROPERLY.

THE MOST FREQUENTLY RECORDED IMPROPER DRIVER ACTION WAS FAILURE TO YIELD THE RIGHT-OF-WAY.

* Pedestrian collisions involved more than one driver or vehicle in some cases.
Data not available on driver action in 9 cases.



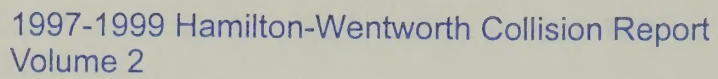
Exhibit 3.9

PEDESTRIAN AGE vs INJURY STATUS

PEDESTRIAN AGE	STATUS OF INJURY						% MAJOR OR FATAL INJURY
	NONE	MINIMAL	MINOR	MAJOR	FATAL	TOTAL	
0-4	2	3	4	1	0	9	11.1%
5-9	2	14	11	2	1	30	10.0%
10-14	2	16	18	5	0	41	12.1%
15-19	1	12	14	1	0	28	3.5%
20-24	1	13	8	3	0	24	12.5%
25-34	1	12	15	2	0	30	6.6%
35-44	3	11	15	4	0	33	12.1%
45-54	0	8	15	4	1	28	17.8%
55-64	2	10	10	3	1	27	14.8%
65-74	1	5	11	3	2	21	23.8%
75-98	0	3	12	3	1	20	20.0%
UNKNOWN	9	6	4	0	1	20	5.0%
TOTAL	24	115	136	31	6	312	12.0%
%	7.6%	37.0%	43.5%	9.9%	2.0%	100.0%	

PEDESTRIANS

**OF ALL PEDESTRIANS INVOLVED IN COLLISIONS, 88%
SUFFERED NO INJURY OR ONLY MINIMAL OR MINOR INJURIES.**



PEDESTRIANS



Chapter Four

Environment



Chapter 4

Weather and Light Conditions

Exhibit 4.1 indicates that most collisions, in the period 1997-1999, occurred during clear weather conditions and under daylight conditions.

Road Surface

72 percent of collisions occurred under dry pavement conditions (Exhibit 4.2).

Pavement Markings

As shown in Exhibit 4.3, 87 percent of collisions occurred on roadways where the pavement markings were visible. It is important to note that pavement markings that are not visible to the driver are not necessarily associated with collision cause. Further analysis would be necessary to indicate whether or not there was a causal relationship.

Road Characteristics

The majority of collisions occurred at locations with straight, level geometrics (Exhibit 4.4). Exhibit 4.5 shows that most collisions (both non-intersection and intersection) occurred on two-way, undivided roads.

Road Location

Exhibit 4.6 indicates that the greatest number of collisions occurred at or near intersections. As the exposure to vehicle conflicts is inherently greater at intersection locations, this result is not unexpected.

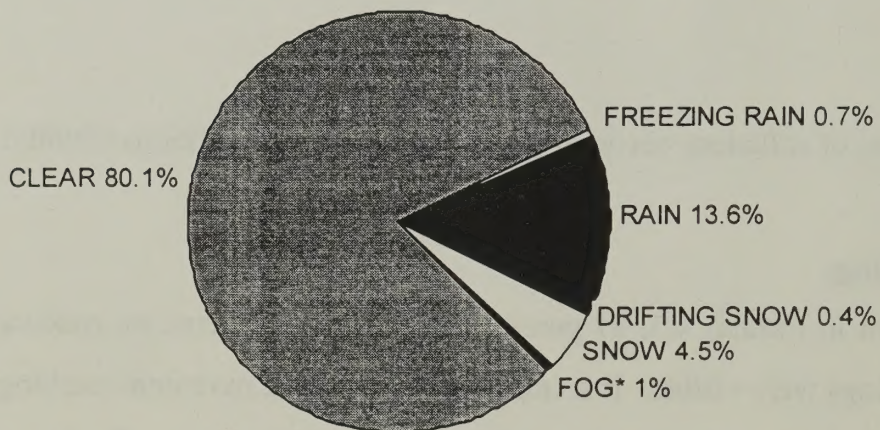
Fixed Objects

There were 288 recorded cases where vehicles struck fixed objects adjacent to the road (Exhibit 4.7). 79 drivers struck utility poles or poles supporting signs, the next most common object hit was a curb (78).

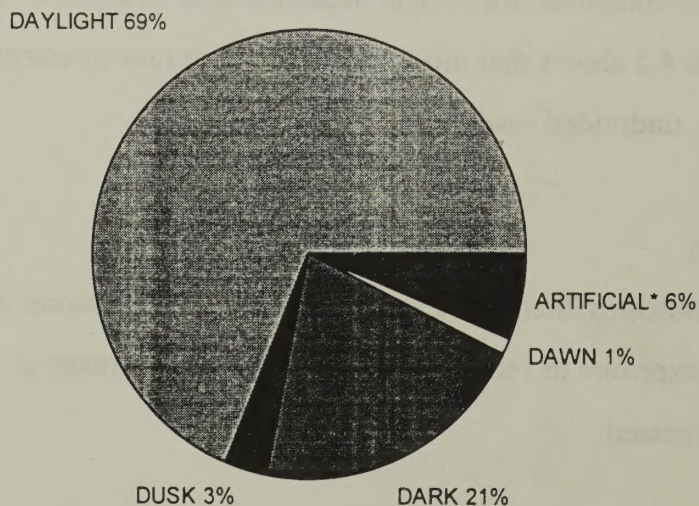


Exhibit 4.1

WEATHER AND LIGHT CONDITIONS IN MOTOR VEHICLE COLLISIONS



* INCLUDES FOG, MIST, SMOKE AND DUST



* INCLUDES ARTIFICIAL DAYLIGHT, DAWN, DUSK AND DARK

**80% OF COLLISIONS OCCURRED DURING CLEAR WEATHER.
69% OF COLLISIONS OCCURRED IN DAYLIGHT.**

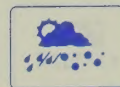
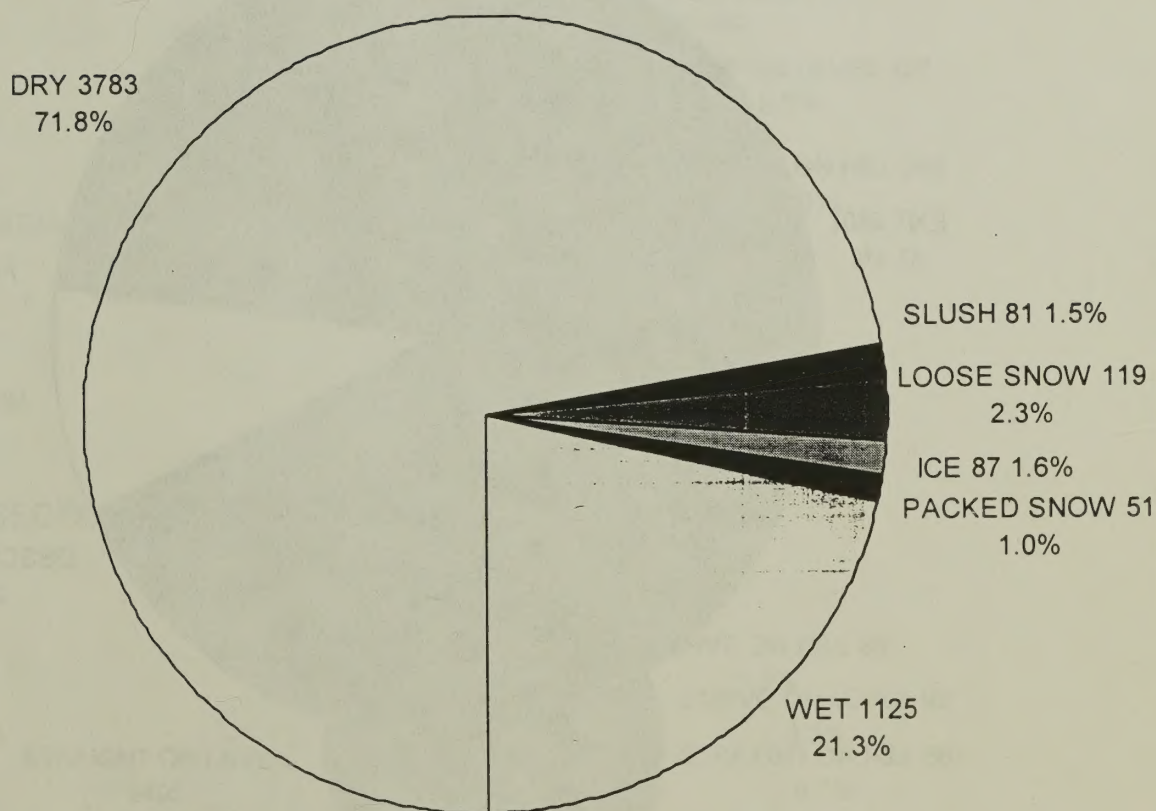


Exhibit 4.2

ROAD SURFACE CONDITIONS IN MOTOR VEHICLE COLLISIONS



ENVIRONMENT

72% OF COLLISIONS OCCURED ON DRY ROAD SURFACES.

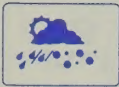
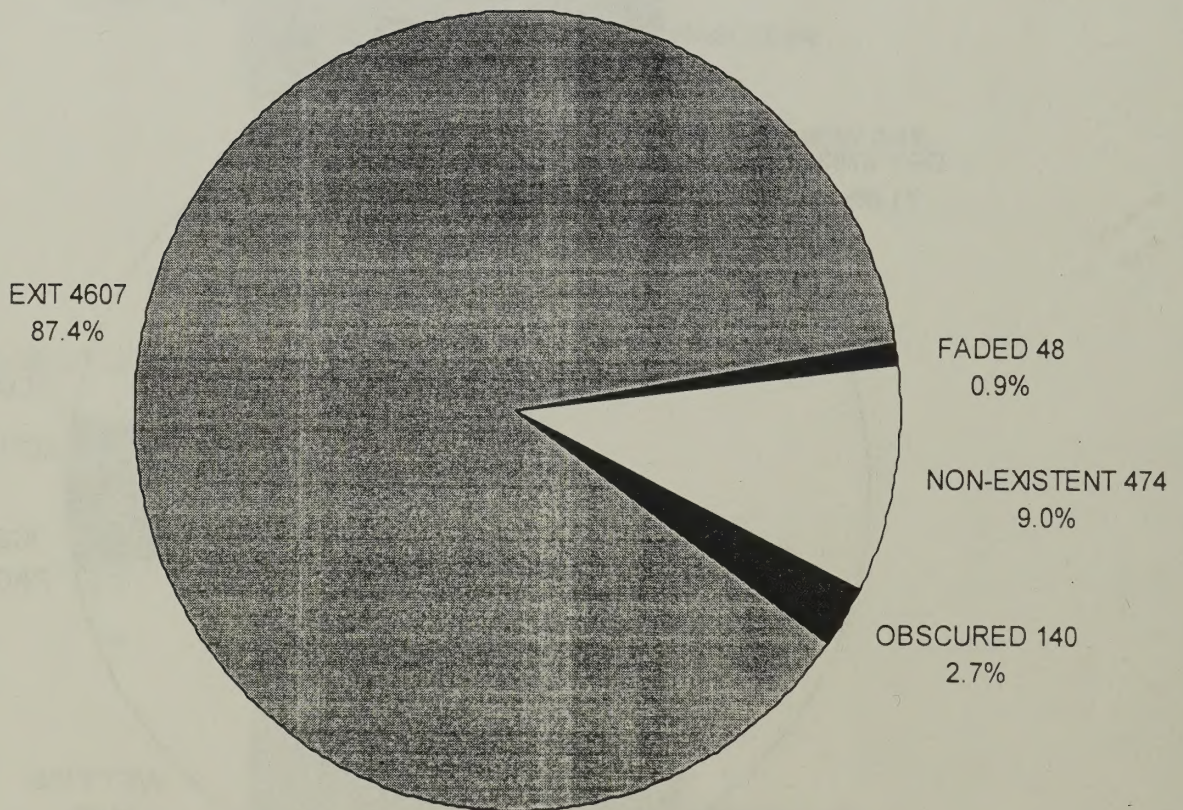


Exhibit 4.3

PAVEMENT MARKINGS IN MOTOR VEHICLE COLLISIONS



**IN 13% OF COLLISIONS, PAVEMENT MARKINGS
WERE NOT EASILY VISIBLE.**

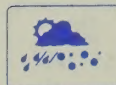
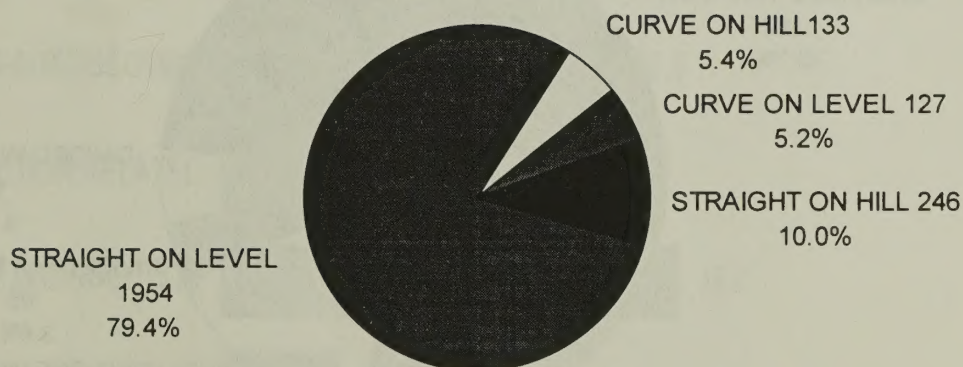


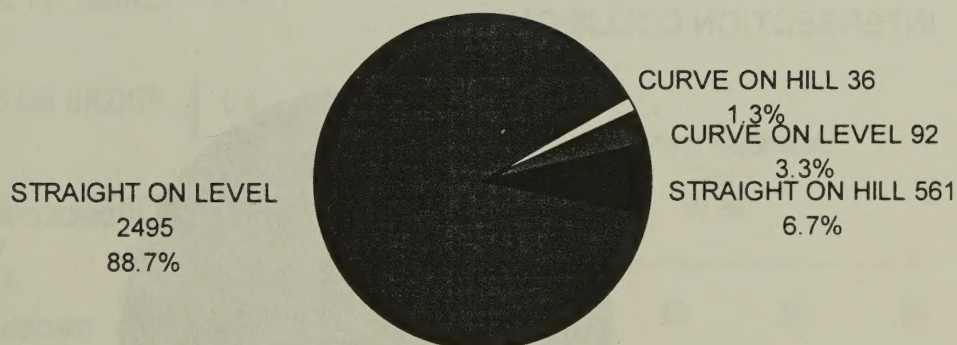
Exhibit 4.4

ROAD ALIGNMENT IN MOTOR VEHICLE COLLISIONS

NON-INTERSECTION COLLISIONS



INTERSECTION COLLISIONS



**MOST COLLISIONS OCCURRED AT LOCATIONS WITH
STRAIGHT, LEVEL GEOMETRICS.**

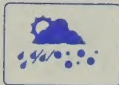
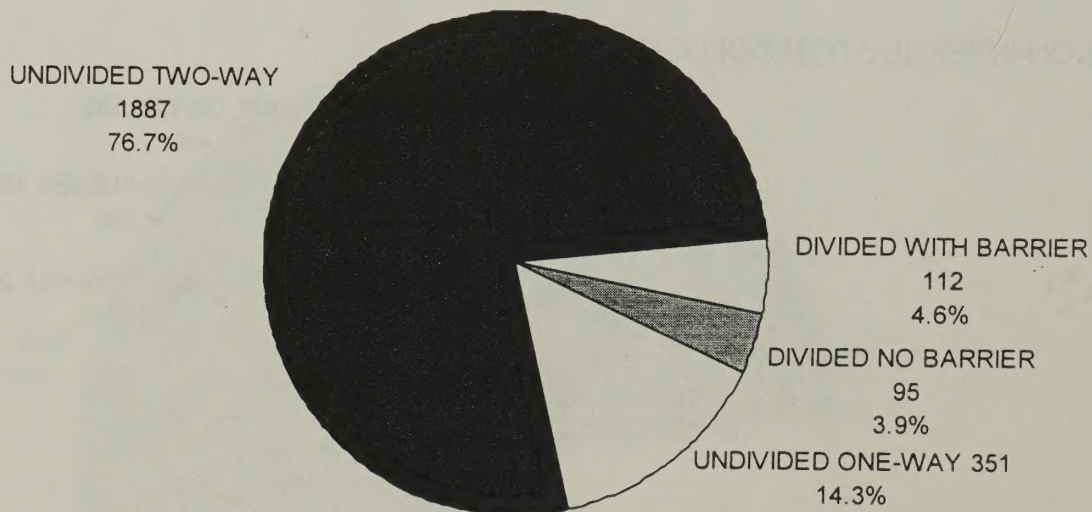


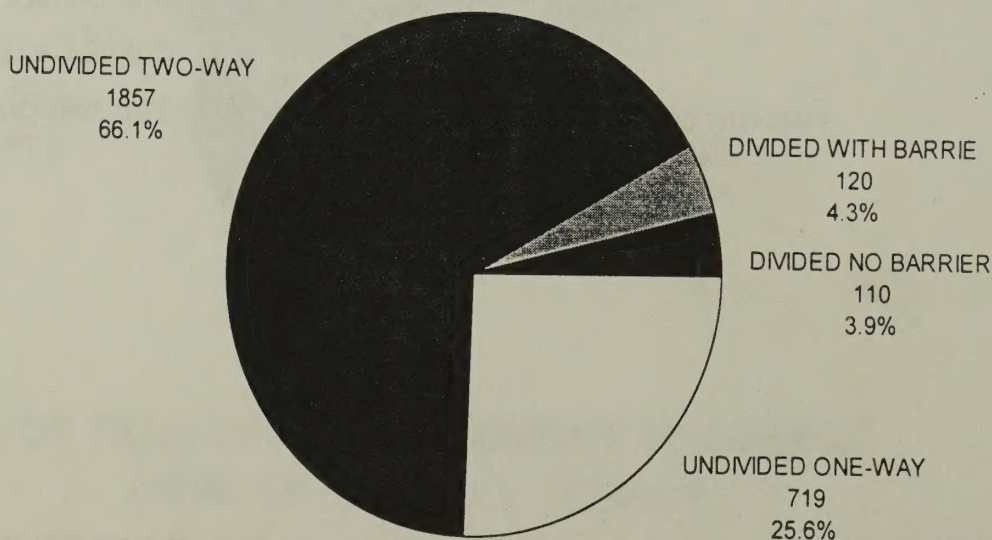
Exhibit 4.5

ROAD CHARACTERISTICS IN MOTOR VEHICLE COLLISIONS

NON-INTERSECTION COLLISIONS



INTERSECTION COLLISIONS



MOST COLLISIONS OCCURRED ON UNDIVIDED TWO-WAY ROADS

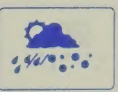
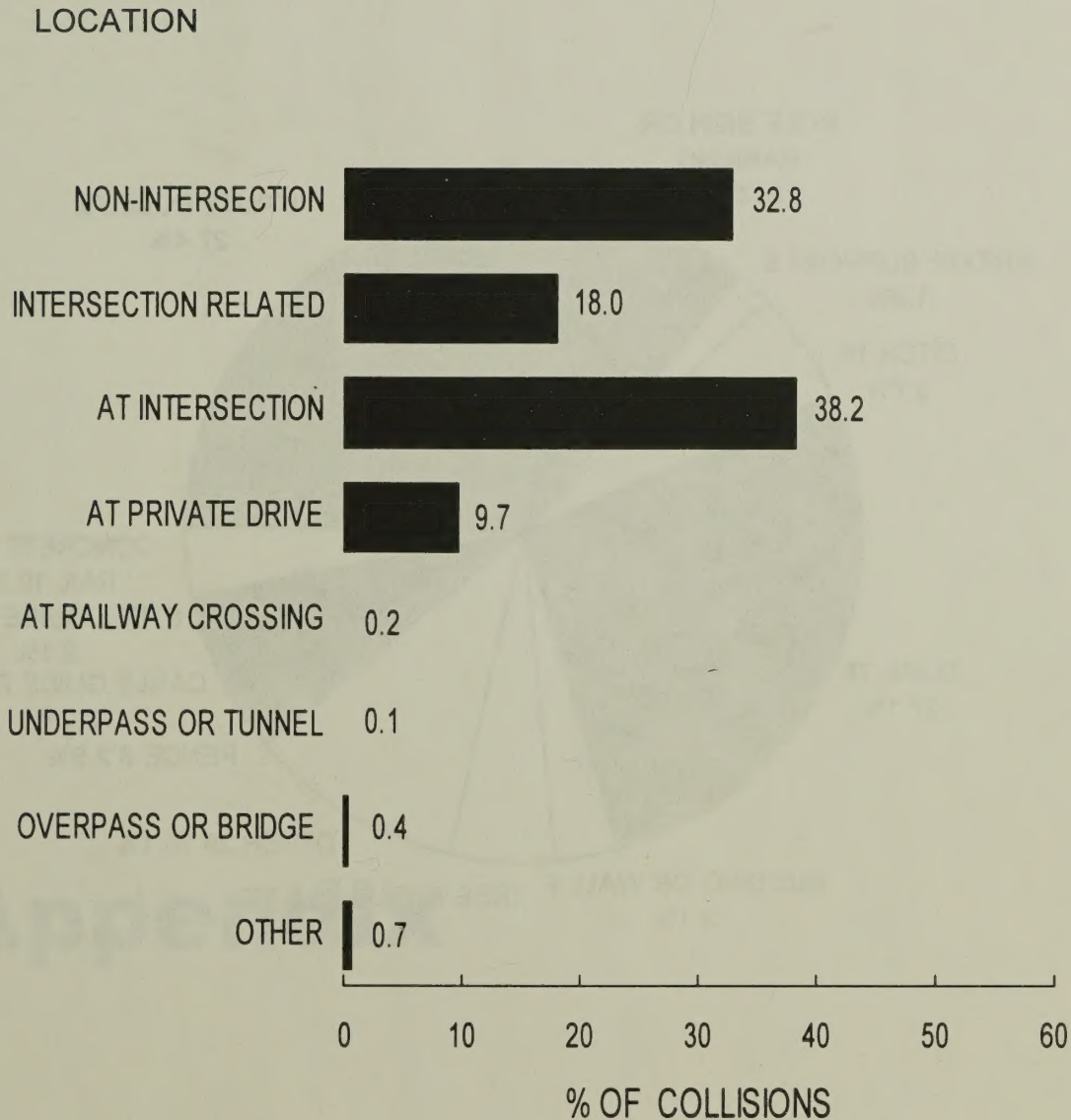


Exhibit 4.6

LOCATION OF COLLISIONS



**THE LARGEST NUMBER OF COLLISIONS
OCCURRED IN, OR NEAR INTERSECTIONS**

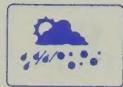
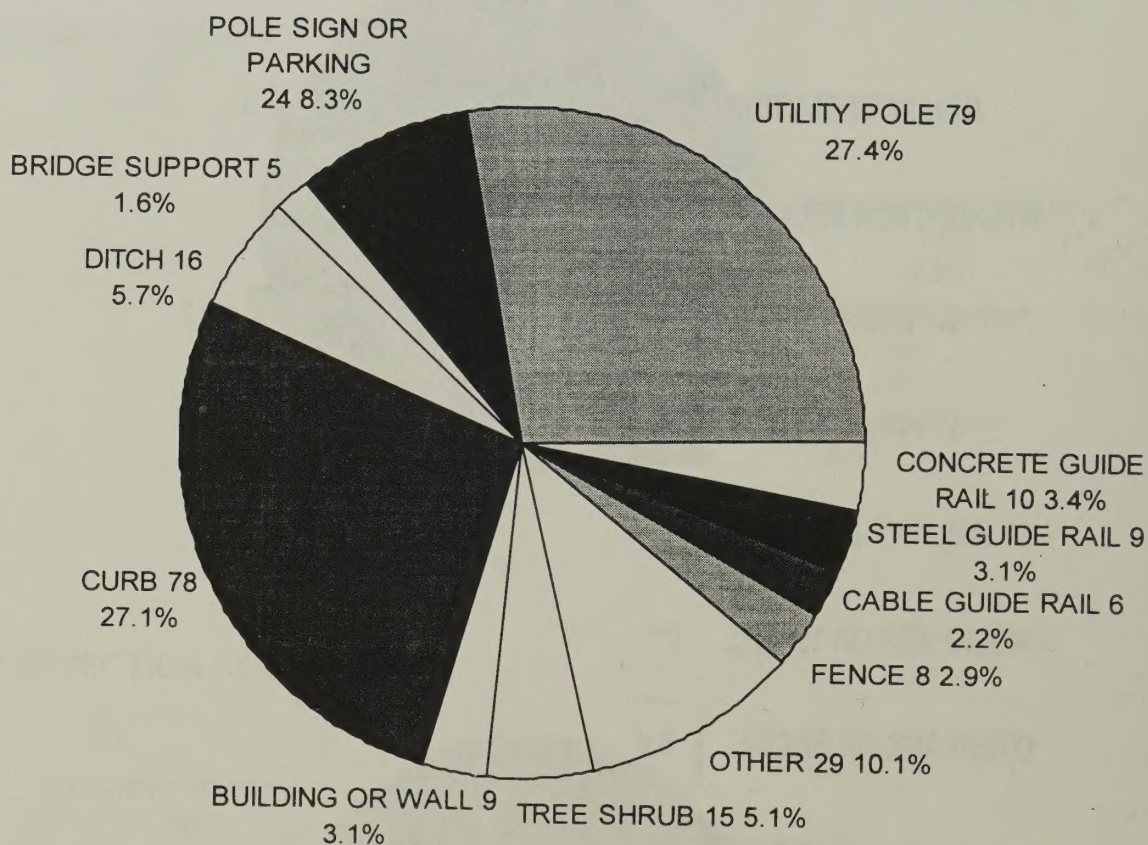


Exhibit 4.7

TYPES OF FIXED OBJECTS STRUCK IN MOTOR VEHICLE COLLISIONS



**DRIVERS HITTING FIXED OBJECTS ARE MOST LIKELY TO
STRIKE UTILITY POLES, OR CURBS.**

Appendix

APPENDIX A.1

INITIAL IMPACT TYPES AS DESCRIBED IN EXHIBIT 1.5

FIELD #45 MOTOR VEHICLE COLLISION REPORTING SYSTEM

Initial Impact Type Diagram	Rear End	Head On	Side Swipe	Side Swipe	Overtaking	Right Turn
Code Value	21	22	23	24	25	26
Short Name ♦	REAREND	HEADON	SOSWPOP	SOSWPSM	OVERTAK	RTRREND

Right Turn	Left Turn	Left Turn	Intersection 90°	Right Turn	Right Turn
27	28	29	30	31	32
RTONCOM	LTONCOM	LTRREND	LTOPTHR	RTANGLE	RTSDSWP
					THR/RT

Left Turn	Left Turn	Single Motor Vehicle (SMV) Strikes Unattended Vehicle	Single Motor Vehicle (SMV) Other	Pedestrian / Vehicle	Left Turn / Right Turn	Other
34	35	36	37	38	39	98
LTSDSWP	THR/LT	SMVPARK	SMVOTHR	VEH/PED	LRTSWP	OTHER

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